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General Heading: **BAKER ROTARY WALL SCRAPER and BAKER ROTARY WALL SAMPLER**

BAKER OIL TOOLS, INC.

Main Office and Factory:
6000 So. Boyle Ave., Box 127, Vernon Station, Los Angeles, Calif.
Central Division Office and Factory:
6023 Navigation Blvd., Box 3048, Houston, Texas
Export Sales Office:
19 Rector Street, New York, N. Y.

Unit No. A-16

Subject:

How Baker Wall Scraper Can Assist in Well Completion Operations

Index: 250.1
Date: September 10, 1942
Page: 1 of 1 p.

Hole enlargement and wall scraping constitutes an important step in connection with many types of well completion operations. For such work, operators have found the most efficient and economical tool to use is the Baker Rotary Wall Scraper.

The reason for its popularity is easily explained . . . because the Baker Wall Scraper is sturdily made; safe to use; easy to operate; and has, in relation to its O.D., a great reaming capacity (see below for features which make the Baker Rotary Wall Scraper a safe, dependable tool).

In addition, the Baker Wall Scraper is really "two tools in one" since by substituting Sampler Blades for the regular Scraper Blades, the tool is converted into a Baker Rotary Wall Sampler (see Figs. 5-6). With this device, cores can be taken from the side walls of any uncased hole at any depth. Here is an important conservation feature.

Several popular Wall Scraper uses are illustrated below. For other important applications, send for Baker Broadcast No. 19 . . . a 40-page, illustrated treatise, gladly sent upon request.

CLEARANCE FOR CASING OR LINERS

Fig. 1—Enlarging Hole from Casing Shoe to Bottom to Provide Clearance for Casing or Liner.

CLEAN UP FACE OF PRODUCING ZONE

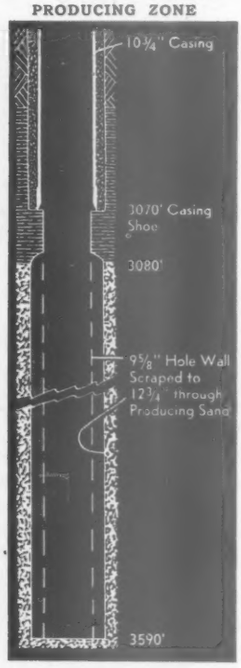
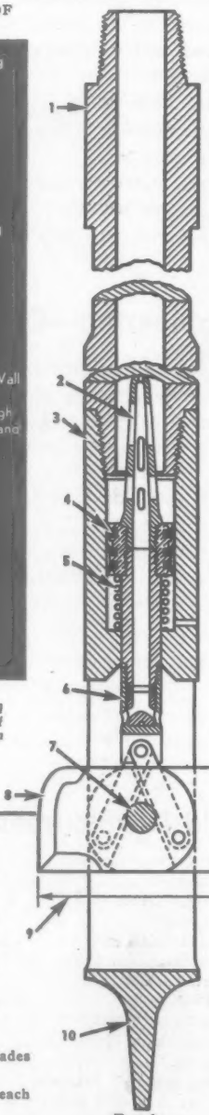


Fig. 2—Scraping Face of Oil Sand and Enlarging Bore of Producing Zone for Maximum Recovery.



Product No. 500

Fig. 7—Showing Construction Details of Baker Rotary Wall Scraper.

HOLE ENLARGEMENT FOR GRAVEL PACKING

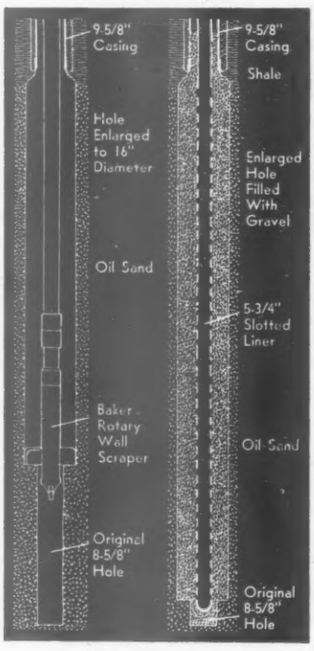


Fig. 3—The Baker Wall Scraper is used to Enlarge the Hole and thus Permit Packing a Substantial Amount of Gravel Around the Liner.

Fig. 4—Here's Completed Job with the Slotted Liner Landed and Surrounded with Gravel in the Area Enlarged with the Wall Scraper.

WALL SAMPLER

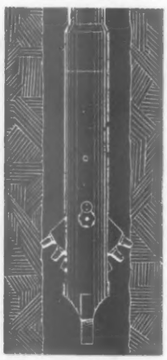


Fig. 5—Blades Opening and Causing Core Tubes to Contact Wall of Hole.

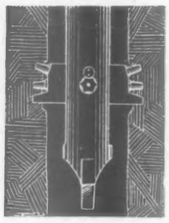


Fig. 6—Tubes Forced into Wall of Hole and Filled with Sample of Formation.

Features Which Make the *BAKER ROTARY WALL SCRAPER* A DEPENDABLE TOOL

(1) **Double Pin Drill Collar—Connects Wall Scraper Body to drill collar.**

(2) **Circulation Screen—Design of cone-shaped Screen minimizes abrasive action of fluid and prevents debris from clogging circulation passages.**

(3) **Wall Scraper Body—Machined out of a solid piece of special alloy steel . . . provides great strength.**

(4) **Plunger Head—Provided with oil resistant Seals to prevent fluid by-pass and insure Piston efficiency . . . Blades will Positively Open.**

(5) **Plunger Spring—Strong Plunger Spring insures blades properly closing.**

(6) **Bushing (Circulation Bean)—Fluid is directed on each blade, lubricating and cooling cutting surfaces.**

(7) **Hinge Pin—Machined from solid piece of special alloy steel.**

(8) **Blades—Machined from special alloy steel forgings . . . afford toughness and hardness. Cutting edges are hard-faced and set with Tungsten Carbide Inserts. Long bearing surface on blades minimizes "corkscrewing."**

(9) **Blade Expansion—Amazing reaming capacity provided by expansion range of Cutter Blades from 4" to 36".**

(10) **Pilot Bit—Centers Scraper and steadies cutting action.**

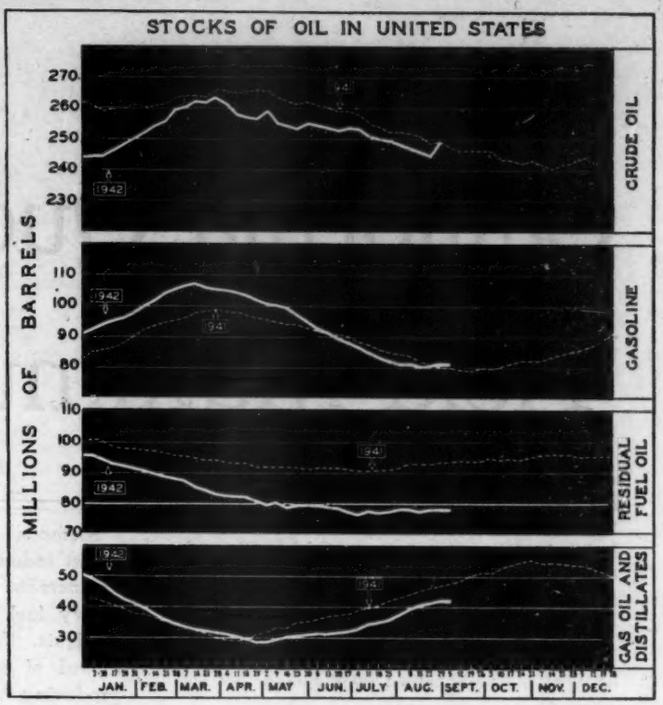
For further instructions and operating details, see pages 279-287 of the 1942 Baker or Composite Catalog.

Service Note

Competent Baker men will service, make suggestions, and otherwise assist in securing best possible results.

Trends

Refiners Have Many Problems Adjusting To New Regulations



REFINERS in the Middle West and Mid-Continent are having difficulty in adjusting their operations to two recent developments, affecting price and transportation operations. The price situation has to do with the OPA ruling interpreting Price Schedule 88. This revision prohibits the use of Oklahoma (Group 3) prices in determining ceiling quotations except in shipments actually made from Oklahoma.

CRUDE PRODUCTION *3,693,630 bbl. daily average—down 277,855 bbl. One year ago 3,794,905 bbl.*

CRUDE STOCKS *249,007,000 bbl. as of Aug. 29—up 2,700,000 bbl. One year ago 249,413,000 bbl.*

GASOLINE STOCKS *80,831,000 bbl. as of Aug. 29—up 388,000 bbl. One year ago 80,394,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *78,034,000 bbl. as of Aug. 29—up 27,000 bbl. One year ago 93,790,000 bbl.*

GAS OIL AND DISTILLATES *42,060,000 bbl. as of Aug. 29.—up 1,644,000 bbl. One year ago 47,089,000 bbl.*

REFINERY RUNS *3,697,000 bbl. daily week ended Aug. 29—down 26,000 bbl. One year ago 4,133,000 bbl.*

Refinery report for week ended September 5 delayed because of Labor Day.

The ruling is interpreted as a change in policy in which delivered prices rather than f.o.b. refinery quotations will be the controlling factor in arriving at ceiling quotations. Refiners generally throughout the Mid-Continent and Middle West have been accustomed to use Oklahoma (Group 3) prices in quoting customers. It is pointed out that this base-price method is a trade practice generally recognized in the sale of farm products and many commodities. It is contended by many refiners that the general enforcement of this ruling will necessitate changes in marketing areas for many refinery operators whose price ceilings at their plants will be lowered if they continue to sell in the same consuming areas. Cases are cited in which, under this arrangement, refiners in Kansas, Arkansas, and middle western points will be practically forced out of certain marketing areas unless they are willing to absorb transportation disadvantages. Changes in the ruling are being urged by many refiners.

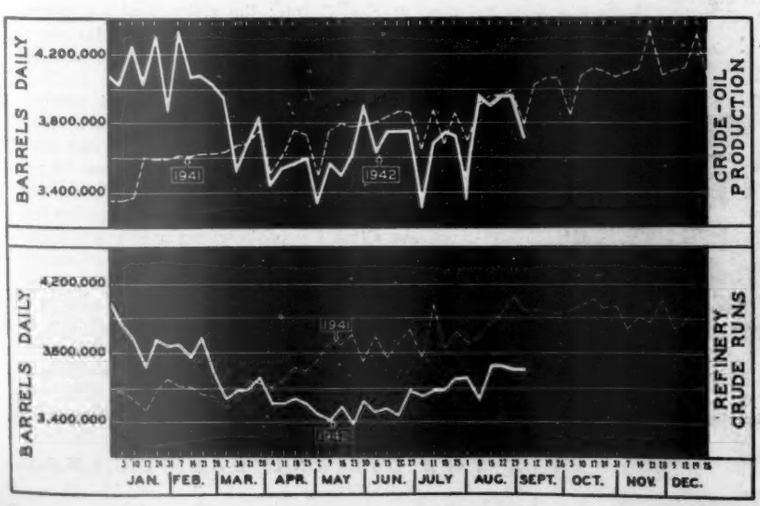
The latest transportation difficulties arise from the application of Directive 57 which prohibits tank-car transportation of petroleum products in 20 states of the Middle West and Southwest (see August 27 issue, Page 20). It is now certain that exceptions will have to be made to this ruling if petroleum products are to be delivered to several sections in this large area. Temporary exceptions permitting the use of tank cars are being made in thousands of shipments to northern and western points.

It has been suggested that the rule be amended to permit tank-car shipments to North Dakota, South Dakota, western Nebraska, northwestern Kansas, the Peninsula area of Michigan, and parts of Minnesota. These areas are all remote from refineries, with limited pipe-line facilities. Truck deliveries, particularly during the winter months, could not supply the demands. It is known that due to the tank-car shortage several refiners are making surveys to increase the pipe-line movement of products. It is reported that four Oklahoma refiners have completed plans to lay and operate a cooperative line which will deliver gasoline from their plants to a large trunk-line system with several middle western terminals.

DAILY AVERAGE PRODUCTION FOR WEEK

	Sept. 5 crude oil	Sept. OPC quota all oils	Aug. 29 crude oil
Arkansas	71,150	81,900	71,100
California	717,500	791,500	738,275
Colorado	6,765	7,000	6,815
Eastern fields	96,550	109,300	97,100
Illinois	267,500	289,200	266,580
Indiana	18,000	19,300	18,350
Kansas	245,850	285,300	290,050
Louisiana	328,200	334,800	338,150
North Louisian	*96,700*	.....	*97,600*
Louisiana Gulf Coast	*231,500*	.....	*240,550*
Michigan	61,950	66,700	61,800
Mississippi	72,500	50,200	75,500
Montana	23,815	22,800	23,290
Nebraska	3,400	3,900	3,500
New Mexico	98,450	98,100	98,460
Oklahoma	379,500	415,300	378,600
Texas	1,207,900	1,397,800	1,412,350
East Texas	*291,000*	.....	*363,000*
West Texas	*180,150*	.....	*226,800*
North Central Texas	*130,450*	.....	*136,400*
East Central Texas	*79,700*	.....	*87,150*
Texas Panhandle	*75,000*	.....	*88,900*
Texas Gulf Coast	*389,950*	.....	*432,300*
Southwest Texas	*61,650*	.....	*77,800*
Wyoming	94,600	93,400	91,565
Total United States	3,693,630	4,066,500	3,971,485
Total production, January 1-September 5, 1942			938,172,790 bbl.
Same period last year			921,588,545 bbl.

Texas shutdown days, Aug. 30, 31, Sept. 5; previous week Aug. 23, 29.



California Quotas Adjusted to Yield Maximum Fuel Oil

By STARK FOX

Methods adopted by the Pacific Coast industry and federal authorities to increase the California output of heavy fuel oils are explained in this analysis. Expediency has forced removal of restrictions on those fields producing crudes yielding high percentages of fuel oil, providing capacity withdrawals will cause no physical damage.

Since 1937, the author has been associated with the Oil Producers Agency of California, the Conservation Committee of California Oil Producers and the OPC District 5 Production Committee and now serves on the staffs of all three organizations.

EIGHT months' experience in distributing pool quotas within the total state quota established by the Office of Petroleum Coordinator has begun to delineate a pattern which, with probable minor modifications in future months in response to changing conditions will serve as the basis for the allocation for an indefinite period.

The present method of allocation seems to be approaching a solution of the two problems, those of satisfying both federal requirements and war demands.

Federal government requirements have been established through the approval of all schedules submitted "with reservations." The reservations have in fact constituted directives to the production committee, issued to clarify allocation and conservation principles which the OPC desired to have established. The reservations have frequently been coupled with statements to the effect that if certain practices were continued, subsequent schedules could not be approved.

The principles established by the federal Government through its "reservations" in approvals of the schedules for the individual months from March to September, inclusive, have included instructions to the production committee to:

1. Reduce the allocation to light-oil fields where the actual production of isobutane would not thereby be materially affected.
2. Increase the allocation to heavy-oil fields.
3. Allocate sufficient oil to fields producing natural gas to satisfy the demand for isobutane "when considered in connection with the isobutane obtained from less prolific sources."
4. Reduce the allocation to high gas-oil ratio fields to the extent necessary to eliminate the blow of gas to the air.
5. Increase the number of fields exempt from restriction, "particularly those whose production will assist in satisfying the demand for heavy oil."
6. Give less weight to minimum rates of production as a "matter of interfield allocation" since such minima "may well lead, in the future, to a lack of balance between the kinds of oil necessary for the prosecution of the war or cause the venting of natural gas to the air."
7. Provide compensating allocations in so far as possible where Conservation Order M-68 has prevented offset drilling.
8. Base restrictions of production on reservoir characteristics of pools as entitles, rather than on individual well capacities; the pool "maximum efficient rate" not to be the sum of the so-called individual well "maximum efficient rates."

In developing the September 1942 schedule, which can be taken as an example since it is the latest approved and is the closest approach to absolute satisfaction of both governmental and demand requirements yet attained, the production committee first exempted certain pools from restriction of production. For some of these pools, the exemptions were based upon the pool classification as established by the engineering subcommittee of the production committee, and for others, upon the fuel-oil yield.

Pools are divided into six classes: 1 *a*, *b* and *c*, and 2 *a*, *b* and *c*. Pools in Class 1 are those in which capacity production would result in reduction of ultimate recovery, and those in Class 2 are those in which no appreciable damage to the pool would result from unrestricted output. The subdivisions within classes indicate relative availability of production without artificial lifting, as well as progressive stages of depletion, relative average well size, and utilization of present equipment.

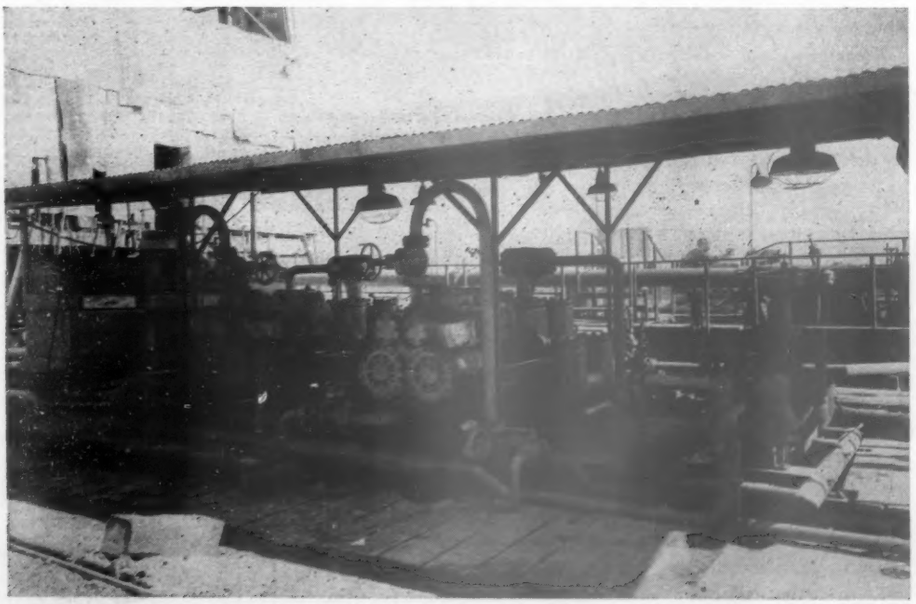
The first exemptions, made before application of the fuel-oil adjustment, included all Class 2 *b* and *c* pools. Class 2 *b* pools are those which are generally beyond 50 per cent depleted, but have productive abilities moderately in excess of the economic minimum. Class 2 *c* pools are usually in the extreme stages of depletion, with capacities not materially in excess of the economic minimum necessary to assure the continuity of production and prevent premature abandonment.

Exemptions From Restrictions

These classes of pools have been exempted from restriction for the past several months, but additional pools were exempted in September in order to supply sufficient fuel oil to satisfy requirements. These exemptions, based upon the fuel-oil content of the crude, included Class 1 pools whose crude yields 70 per cent or more fuel oil, in which case the pools were given allotments equal to their capacity to produce. Pools in that category include: Upper central area of Elk Hills; the Vedder zone at Mount Poso and Round Mountain; the Vaqueros at Capitan; Lompoc; the Stern zone at East Coyote; the main area of Huntington Beach (new); the Tar Bolsa and the upper and lower Ashton zones of the Bolsa area of Huntington Beach (old).

Pools in Class 1 whose crudes yield between 55 and 70 per cent fuel oil were allocated their maximum efficient rates of production, and pools in Class 2 *a* whose crudes yield more than 55 per cent fuel oil were exempt from restriction and given allotments equal to their productive capacities. Class 2 *a* pools whose production yields less than 55 per cent fuel oil were given an unrestricted allotment equal to 50 per cent of their capacities, while the remaining 50 per cent was restricted in the same way as the quotas were determined for the other nonexempt pools.

The exemptions from restriction on production thus determined totaled 433,719 bbl. per day out of an allocated crude quota of 746,700 bbl. An



Pump hookup used on deep test in the Rio Bravo, California, field

additional 3,300 bbl. a day were set aside for new completions to be brought on production during September, making the total September quota 750,000 bbl. These exemptions were divided among the different classes of pools as follows:

Class 2 *b*, 2 *c* and 2 *a*, containing more than 70 per cent fuel oil (exempt)	320,807
Class 2 *a* pools containing between 55 and 70 per cent fuel oil (exempt)	15,165
Class 1 pools containing more than 70 per cent fuel oil (exempt)	70,097
Maximum efficient rates of Class 1 pools, containing between 55 and 70 per cent fuel oil	27,650
Total	433,719

This figure, when deducted from the total oil allotment of 746,700 bbl., left a balance of 312,981 bbl. daily to be allotted to the remaining pools. However, the maximum efficient rates of the remaining pools totaled 423,616 bbl., which meant that it was necessary to restrict production from these pools by 110,635 bbl. This reduction was made by the application of a power factor to the maximum efficient rate, modifying the result obtained by a percentage figure to balance precisely.

The basic factor used in setting the primary quota is the maximum efficient rate of production of the pool, determined for all Class 1 pools by the engineering subcommittee of the production committee.

Factors in Calculation

Important factors used in this calculation include: (1) Size of the reservoir in acre-feet; (2) volume available to active hydrocarbons; (3) pressure-volume relationship and amount of gas; (4) original pressure, subsequent pressure history and indicated trends; (5) average density of well spacing; (6) average permeability and variations from the average; (7) solution gas-oil ratio, subsequent ratio history and indicated trends; (8) production history and indicated capacity; (9) well characteristics and productivity indices; (10) the type of control, whether depletion, water drive, or a combination of both; (11) stage of development and depletion.

Maximum efficient rates thus determined are not final and set figures. The engineering subcommittee reviews and revises them as more complete and comprehensive data become available, and has adopted a program of review of pool rates at intervals of not greater than 6 months, with more frequent reviews for critical pools.

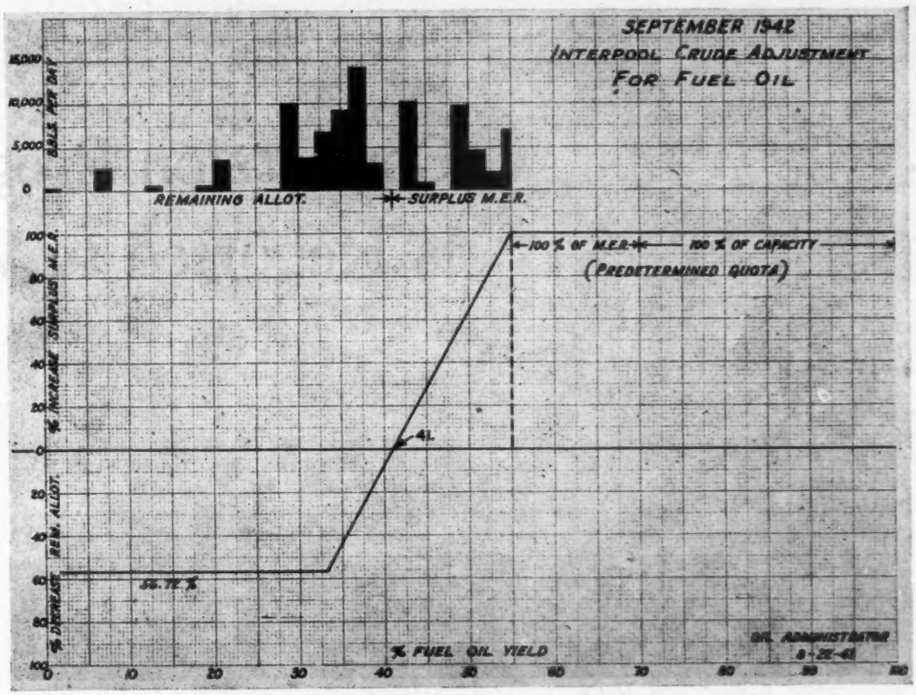
Importance of accurate determination of maximum efficient rates is twofold. First, under the terms of Recommendation 19 they represent the top limit on production levels, unless certification is given a higher rate by the OPC, and second, they constitute the base to which is applied the power factor and subsequent percentage modification to determine the primary quota for the restricted fields.

In September, the fuel-oil yield of the unrestricted pools and from the primary quotas established for the restricted pools was found to fall short of requirements, making it necessary to apply an adjustment to the primary quotas of the restricted pools, based on the relative fuel yield of the crude, thereby increasing the available supply.

Certain preliminary adjustments to take care of unique conditions were made before fuel-oil modifications were applied to these quotas. Discovery wells were allotted not less than 150 bbl. per day for the 3 months following the month of their completion, under a production committee rule to give discovery wells a 3-month 150-bbl. daily minimum allotment. Allotments to other fields were reduced to the limit of gas outlets, and one reservoir was given an additional allotment to attain the reservoir minimum-efficient rate to minimize waste, established in accordance with a recommendation of the engineering subcommittee.

Determining Fuel-Oil Adjustment

A fuel-oil adjustment to restricted pools was made. In this adjustment, a straight line curve was drawn from a point that increased allotment to pools yielding 55 per cent fuel oil to their maximum efficient rates, to a point that decreased the allotment to pools yielding 34 per cent fuel oil or less by 56.72 per cent, zero adjustment falling at 41 per cent fuel-oil yield. The increases were made by applying the indicated percentage to the difference between the primary quota and the maximum efficient rate; the decreases by applying the percentage to the difference between the primary quota and the minimum rate. The accompany chart shows the degree of adjustment to restricted pools of varying fuel-oil content.



Graphic illustration of how allocations were adjusted to increase production of crudes yielding high percentages of residual fuel

Preparation of the interpool allocation is performed by the administrative office of the Conservation Committee under direction of the production committee. Pertinent data from the various functional committees, as well as the engineering subcommittee and the statistical committee, are turned over to the administrator's staff. The data developed by this office each month include: (1) Number of ratable wells in each pool; (2) capacity production for all unrestricted pools, and the engineering subcommittee's report on information augmenting restricted pools; (3) minimum allotments for restricted pools; (4) new completions, recompletions, and resumptions for all pools for the current month and an estimate for the coming month.

A "derivation of pool crude quotas" is made by the administrator's staff after consideration of these and other pertinent factors, including known requirements for crude, gas and petroleum products, and limitations in transportation, refining, or gas outlets. This report is reviewed in detail by the production committee, and careful consideration is given each phase of the allocation by consultation with a representative of each of the functional committees concerned.

Data as to fuel-oil yields of crudes from the various fields of the state are furnished by the refining committee for the district; transportation conditions affecting crude production are reported by the transportation committee; the natural-gas and natural-gasoline committee relays information as to outlet for natural gas. The latter is particularly important at this time, since the OPC has been increasingly insistent that no gas shall be blown to the air in view of prospective demand by domestic and war-industry consumers during the coming winter.

War Products in Balance

In view of the demand for fuel oil, the schedules developed during the 8-month operation of the program have increasingly liberalized allocations to pools which produce heavy crude high in fuel-oil content, while reducing the relative allocations to light-oil pools. The September schedule is the first which shows an estimated balance of supply of fuel oil with requirements for the product. It is estimated that motor fuel and gas and diesel oil will be added to storage somewhat during the month, and that certain other products will be withdrawn from storage. But the products for which war demand is most important will be in balance for the first time. There are, however, limitations as to future results along this line.

In view of prospective high winter demand, the OPC has insisted that no natural gas be blown to the air, thereby definitely limiting the allocation to certain heavy-oil fields, Wilmington and Santa Maria Valley in particular. These fields, which produce the type of oil most in demand, are now producing to the limit of their respective facilities and outlets, which establishes a ceiling for their oil production. This ceiling applies even though the fields could produce efficiently at higher rates. Elimination of this bottleneck would, in part, relieve the fuel-oil shortage which has made it necessary to produce other fields at rates greater than their maximum efficient rates.

Baruch Committee Report Is Expected to Clarify Policies Concerning Rubber Supply

WASHINGTON, D. C.—The formal report by the president's special committee on rubber is expected to be submitted to the White House some time this week and certainly not later than September 15.

Meanwhile, unofficial reports circulated in Washington that the committee, headed by Bernard M. Baruch, had virtually decided on at least four of the major proposals it will recommend. They are:

1. A nation-wide speed limit of 35 miles per hour.
2. Limit each automobile to five tires.
3. Limit each family to one automobile.
4. Provide for government purchase, at a fair price, of all tires and automobiles above the fixed limits.

There is a distinct probability that the refinery-conversion program for increasing the production of butadiene will be assigned top rank as the quickest and most desirable method of obtaining the chief component of synthetic rubber. Rumors on content of the report were that an increase in the over-all project will be recommended by using facilities not previously included in the program. This may mean, observers said, that production from converted existing facilities will be assigned a permanent place in the program along with the special butadiene plants now under construction by government contract.

Converted plants, the committee is understood to have decided, could add as much as 300,000 tons of butadiene to the annual production of 800,000 to 1,000,000 tons thus far envisaged from special facilities. The three committee members, Messrs. Baruch, Compton and Conant, aided by more than 20 scientists and technical experts, have been making a thorough study of the synthetic-rubber program and related matters such as restrictions on automobile use through gasoline rationing or otherwise. The committee was appointed August 6 and the past month has been consumed examining all phases of the program.

Other Agencies Inactive

While committee hearings have proceeded, other government agencies dealing with the synthetic-rubber problem have been outwardly inactive. The agencies have refrained from aggressive action, fearing, according to reports in Washington, that their efforts might be in conflict with the Baruch committee's recommendations. Consequently, the uncertainties and appearance of inaction have been magnified by the passage of a complete month during which all pertinent information has been subordinated to the anticipated report.

Much interest and no little impatience have been displayed by the general public on the Baruch report. Congressional critics of the rubber program have been particularly irritated by the inactivity.

Members of the Gillette committee of the Senate have threatened to resume their demands for making a greater proportion of the synthetic rubber from alcohol if the report is not favorable to the farm bloc. Preliminary information on the Baruch committee's determination that oil-refinery conversion holds the most possibilities for speedy and adequate production indicates that no basic changes will be recommended and that the oil industry will remain as the supplier of a large majority of the raw material.

An unofficial committee of the House which has been investigating the petroleum shortage in the East Coast area threatens to conduct another investigation of Rubber Reserve Co., unless the Baruch report gives full details and recommends a satisfactory program. In a speech in the House last week, Rep. Fred A. Hartley, Jr., of New Jersey, a member of the unofficial committee, excoriated Secretary of Commerce Jesse Jones and Stanley T. Crossland, vice president of Rubber Reserve, for their refusal to divulge details of the rubber program to this group. Though the refusal was based on the pleas of military secrecy and the impendence of the Baruch report, Mr. Hartley said that various public statements by Rubber Reserve officials indicated to him that the company is attempting to conceal its activities. He particularly criticized the refusal to adopt the Houdry process for making butadiene. Mr. Hartley introduced a resolution to make the committee official and give it power to subpena witnesses so it can investigate Rubber Reserve, but no action on this resolution is expected until after the Baruch report is made public.

Preliminary information on the Baruch report contained a prominent omission. The committee apparently will not recommend nation-wide rationing of motor fuel as a means of conserving rubber, although the national speed limit of 35 miles an hour which probably will be proposed would, in effect, accomplish both.

Conversion Program Progress Is Reported to War Council

PROGRESS in the governmental-sponsored conversion of existing refineries to the manufacture of "quick" butadiene for synthetic rubber as well as such other important war products as isoprene, ethyl benzene, isobutylene, benzene, and toluene was reported last week to the Petroleum Industry War Council by its committee on synthetic rubber.

Details of the status of the program were not released, but it was indicated by W. S. S. Rodgers, chairman of the committee, that the production of butadiene under the plan, when and if specific authorizations are obtained from the offices of the petroleum coordinator, WPB and Rubber Reserve Co. output probably can exceed 200,000 tons annually, and in addition even larger quantities of other materials vitally needed for the war can be obtained.

The plan advanced previously by the committee in cooperation with the refining division of OPC was termed the "quick" butadiene program, but its magnitude has increased so greatly by the inclusion of other vital products that it now is called the "refinery conversion" plan. Relatively little new scarce material is needed under the plan. However, it is so complicated that its exact application to specific refineries has required extensive planning.

The committee also reported progress in the development of at least a small-scale program for the manufacture of flexon synthetic rubber, but a larger plan cannot yet be projected because of uncertainties in the supply of the isobutylene. The committee stated that it had recommended a program for flexon manufacture using a small amount of new materials and not interferring with the production of other war products. Such a program, the committee said, would give complete although small-scale experience that would be extremely valuable in later planning.

Floor Fight on Depletion Tax Allowance Strongly Hinted

WASHINGTON, D. C.—Spade work was started last week for the threatened attack on the depletion allowance which, a day earlier, had been retained in the general revenue bill by a vote of 14 to 7 in the Senate finance committee. Approval of the depletion allowance was voted by the committee on motion of Sen. Tom Connally of Texas.

The Senate bloc seeking abolishment of depletion allowance is headed by Sen. Robert M. La-Follette, Jr., Wisconsin, who declared, after the favorable vote, that the committee was preparing to make up "out of the hide" of individual taxpayers approximately $1,000,000,000 of potential annual revenues lost in revisions to the tax bill.

"When the committee refuses to close such loopholes as these," Senator LaFollette declared after the favorable vote to retain depletion allowance, "it becomes apparent where additional revenue is going to have to be obtained. The individual taxpayer is going to get the axe just where the chicken got it."

The Senate committee's action on the depletion provision sustained a previous House refusal to change the rates of the present law. Oil operators are now permitted to deduct 27½ per cent of gross income from producing properties for depletion. The rate for sulfur is 23 per cent; metal

mines, 15 per cent and coal-mining operations, 5 per cent.

Randolph Paul, attorney for the Treasury Department, proposed to eliminate percentage depletion allowances for oil and mining operations and to establish such credits on a cost basis. Mr. Paul said such changes would add $200,000,000 in yearly revenue.

Oil-company executives, trade-association leaders, and consulting technicians successfully argued that elimination of the depletion allowance would seriously reduce exploratory operations.

Senator LaFollette is expected to spearhead an attack on the depletion allowance when the revenue bill reaches the Senate floor.

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ODT Order Reserves Large Cars For Eastern Oil Service

WASHINGTON, D. C.—A new Office of Defense Transportation order, effective October 10, prohibits use of tank cars of less than 7,000 gal. capacity in moving oil to the East; prohibits use of larger tank cars in any except East Coast service; and requires a special permit to haul oil in tank cars less than 200 miles. The permit system previously was limited to 100-mile radius.

Last week the Petroleum Industry War Council recommended amendment of ODT Order 7 to prohibit the movement of tank cars for transportation of petroleum to distances up to 150 miles, except by permit, and that all supplies of oil be moved from the nearest point at which they are available by transport trucks.

The council also recommended that the ICC grant all applications for operating rights filed by truck operators for hauls up to and including 200 miles.

Florida Line Will Open Construction Bids September 15

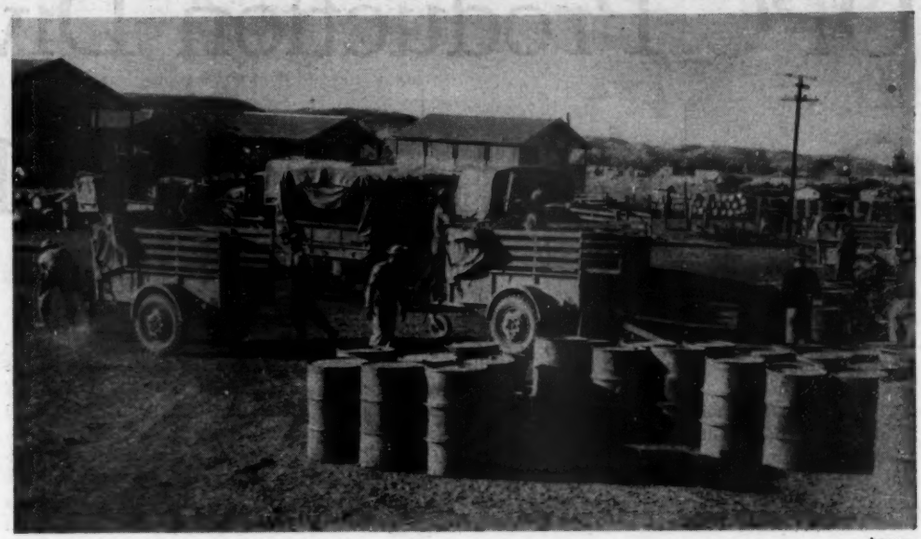
WASHINGTON, D. C.—Trans-Florida Pipe Line Corp. will open bids September 15 for construction of the 220-mile government-owned 8-in. line from Carabelle to Jacksonville, Fla.

The company has already surveyed 170 miles of right-of-way and purchased some of it. About 50 miles of the American Liberty line in East Texas have been dug up and shipments to Florida will start this week at rate of 30 miles per week. Three storage tanks with total capacity of 172,500 bbl. have been dismantled and are being shipped and about half of the required pumping facilities are ready for shipment. The line is expected to be ready December 15 to move 35,000 bbl. of products daily to Jacksonville for northward barge movement.

WPB Places Furfural Under Complete Allocation October 1

WASHINGTON, D. C.—General Preference Order M-224 issued by WPB places furfural under complete allocation and use control effective October 1, in order to accumulate supplies for butadiene plants scheduled to come into operation next year. All users of more than 55 gal. per month must obtain specific WPB approval on Form PD-600. Furfural required for butadiene in 1943 is three times total consumption for all purposes this year but production is now 25 per cent above current requirements. Defense Plant Corp. will have plant in operation April 1 with annual capacity of 24,000,000 lb. so WPB anticipates no shortage for petroleum refining.

Likewise, dichlorethyl ether, used in purifying lubricating oils and butadiene, was placed under allocation control by Order M-226.



Acme

Another transportation problem. These trucks and small trailers are being loaded with gasoline drums, preparing for a motor-convoy trek of 800 miles from a primary fuel dump in Australia to the northern coastline bomber and naval bases

This Week...

PRODUCTION.—Program of pulling selected East Texas wells being studied. Allowables would be assigned to others on same lease, free materials for use elsewhere. . . . Analysis indicates Illinois completions will total around 700 between now and year end, a gain of 75 per cent over the anticipated activity before M-68-5 was issued. . . . California production falls 45,000 bbl. daily below OPC quota, despite radical upward adjustments in heavy oil fields. . . . Nation's total output, first week this month, about 175,000 bbl. below daily OPC quota, including natural and liquefied products. . . .

TRANSPORTATION.—Legal formalities attended by Government on Project Five Pipe Line organization. Participants exempt from ICC, Elkins Act antitrust regulations until April 1, 1948. . . . Decision reported reached to build crude line from Corpus Christi to Houston-Beaumont, Tex., area. Southwest Texas crude to displace East Texas oil which will move north through "big inch" line next year. . . . Four new tankers launched in August, assigned to other than domestic coastwise service. . . . Defense Supplies Corp. issues detailed regulations, covering policy on reimbursement of eastern oil suppliers for abnormal shipping costs. . . . Exemptions to Directive 57 average nearly 400 daily in OPC District 2. Closer scrutiny of applications promised in near future. . . . Tank-car shipments to East Coast averaged 823,260 bbl., week ended August 29. . . .

MARKETS.—Product prices steady to firm. . . . Eastern buyers resisting current quotations, feel Directive 57 will force selling at more favorable terms. Interior refiners quoting firmly on all inquiries. . . . Natural-gasoline manufacturers report demand in substantial balance with production, prices steady. . . . Crude tight in Middle West. Humble resumes full allowable purchases in West Texas and New Mexico, previously purchased 55 per cent on quotas from those connections. . . . Oil securities inactive; 30 active stocks averaged, for week ended September 5: High, 23.02; low, 22.53; close, 22.82. . . . Refiners increase opposition to OPA ruling prohibiting use of Oklahoma (Group 3) quotations as basis for determining ceilings, when products were actually sold at other points. . . .

RUBBER.—Baruch committee's report due within week. Reported to contain four pertinent recommendations: (1) National speed limit of 35 miles an hour. (2) Limit each car to five tires. (3) Prohibit more than one car per family. (4) Government purchase of excessive tires and cars. . . . PIWC synthetic-rubber committee reports progress in refinery conversion, details withheld pending Baruch report. . . . Permanent spot in butadiene program probable for converted refinery facilities, even after special plants are operating. Means possible increase in total planned tonnage to upwards of 1,000,000 tons annually. . . . Congressional committees chafe at delay of report. House member excoriates Secretary Jones. . . . Gillette committee threatens to reopen campaign unless farm bloc receives higher grading in Baruch recommendations. . . .

RATIONING.—Mechanics of eastern fuel-oil restrictions still under study. Program to aim at 25 per cent reduction. . . . Gasoline quotas to eastern motorists likely to remain unchanged. . . . AAA requests special rations for motorists wintering in warmer southern states, claims absentees would conserve fuel oil by becoming nonconsumers, during critical period. . . .

PRIORITIES.—Provisions of L-41, general construction regulation, tightened. PIWC adopts resolution calling for general equipment inventory. . . . Requirements plan "in the works" for replacement of P-98 but details lacking. . . .

OPC Production Division Has Duty of Insuring Oil Supply

By HENRY D. RALPH

WASHINGTON, D. C.—The old saw that "oil is where you find it" is being modified by the Production Division of the Office of Petroleum Coordinator into something like "find oil when you need it."

This group of 18 men and a dozen secretaries is charged with the duty of "insuring an adequate and continuous supply of crude oil for the war-production program and essential civilian needs." In every other major power in the world such a task requires the use of huge armed forces and large corps of civilian-government experts.

In the United States the job is accomplished by a handful of men because, in common with the rest of the OPC, it boasts "the largest staff of any federal agency"—namely, the entire oil industry. Much of the secret of the success of the OPC is its close cooperation with the industry, and the Production Division is no exception. Every man in the division has been closely connected with the oil industry most of his life, still thinks of himself as an oil man rather than a bureaucrat, and intends to go back to the industry as soon at Hitler surrenders.

The director of the division, Donald R. Knowlton, comes from Phillips Petroleum Co., and so does M. K. Neptune, his righthand man on administrative matters, whom Mr. Knowlton describes as "the man who does all my work around here." The "wheel horse" of the division is its assistant director, Ralph J. Schilthuis, who comes from the Humble Oil & Refining Co. He has been with the division since its inception and works at his job literally night and day.

J. E. (Ed) Heston, chief of the production section, from Cities Service, and the rest of the staff likewise came out of the industry. Even some of the secretaries in the division came from the oil country and speak the oil man's language. M. G. Hoffman, the chief analyst, was a consulting geologist in Tulsa. H. L. Flood, chief of the new section on reclamation of oil-field facilities, was associate editor of the "Petroleum Engineer." And the attorney assigned to the division, Jack Jones (he signs John F. but doesn't answer to it) was attorney for the Corporation Commission of Kansas where he got a liberal education in oil.

Key men in the production division of the Office of Petroleum Coordinator: J. E. Heston, chief of the production section; Jack Jones, attorney; M. K. Neptune, assistant to the director; R. J. Schilthuis (standing), assistant director; D. R. Knowlton, director; Dr. M. G. Hoffman, chief analyst; H. L. Flood, chief of the reclamation of oil-field facilities section

Assuring a sufficient supply of crude oil to win the war is no small job even in a country so blessed with producing fields and with the full cooperation of the oil industry. The job requires treating the producing end of the industry as a unit. Because of disruptions in supplies, demands, and transportation facilities, some fields have to be produced beyond their efficient rates while others must be cut down. Drilling of new wells must be fostered in some areas and prevented in others. And the entire producing end of the industry must be helped to do its job with much less steel and other critical materials than it has been accustomed to using in the free and easy days of peace.

The primary means of accomplishing these objectives is the famous Conservation Order M-68. This was issued by the War Production Board shortly after Pearl Harbor, and has the force and effect of law. It was issued on recommendation of the Production Division, and is administered by it.

The purpose of M-68 is to provide the necessary development of the known oil reserves of the country with a minimum expenditure of critical materials. Its chief provision is that no more than one well may be drilled on each 40 acres without an individual exemption permit, and requiring the pooling or consolidation of surface acreage rights before a well may be drilled.

When M-68 was first issued the wails of the oil industry were loud and shrill. Operators claimed they couldn't possibly keep reserves up to requirements with such limitations on drilling, and many suspected that the requirement for consolidation of interests was more for "social reform" than to conserve steel. But after the first shock the industry accepted M-68 as a necessary war measure and its degree of cooperation has surpassed the greatest hopes of the Production Division. Except for a small but noisy minority the oil producers are not complaining about M-68 now and its enforcement involves no difficult problems. The Production Division defends the pooling provision as being necessary to protect the rights of property owners when the location of wells is restricted by the Government, and it leaves it up to these property owners to work out their methods of consolidating their interests in the single permitted well.

Pass on M-68 Exemptions

Passing on M-68 exemptions is one of the major activities of the Production Division. At the latest count it had received a total of 1,784 applications for exemption. Of these it granted 1,258, denied 320, and found that no exemption was required in 206 cases. This, of course, is in addition to some 9,000 wells drilled under the automatic exemptions of the order.

An application for an M-68 exemption comes into the Production Division in triplicate and at the same time a copy goes to the appropriate district office of OPC. The Production Division indexes it, gives it a case number, and notifies the district office of its receipt and asks for a report. The district office does not make a physical survey on the ground, but checks the proposed well location against its maps and records; this usually takes 5 or 6 days. The recommendation of the district office then is attached to the application pending in the Production Division and the case goes to one of the four analysts under Dr. Hoffman. Attorney Jack Jones looks it over for legal quirks, and then the case goes before a committee composed of Messrs. Knowlton, Schilthuis, Heston and Hoffman which is unofficially dubbed the "Drilling Control Board." The application then goes to Robert V. Shirk, the WPB priority specialist stationed in the OPC, and through him to the War Production Board. Officially it is WPB which makes the final decision and signs papers, but actually all the work is done by the OPC Production Division. In only a few cases has WPB failed to follow the recommendation of the Production Division.

As many as 40 applications for M-68 exemptions have reached the Production Division on a single day, while at other times the number drops down to one or two. The average length of time required to pass on an application is about 10 days.

As a means of reducing the amount of steel used in drilling, M-68 has served its purpose well. At the beginning of the year the production end of the oil industry was told that it must get along during 1942 on only 60 per cent as much steel as it used in 1941, and it was estimated that this would permit drilling around 19,000 wells. Now, with 8 months of the year gone, the Production Division figures that it has come within 2 per cent of this goal and that the results for the entire year will hit the forecasts almost exactly on the nose. This has been done almost entirely by dead reckoning, since there are no monthly nor geographic quotas for drilling materials.

This article is the second in a series which is being presented to acquaint the reader with the organization, personnel, and functioning of the Office of Petroleum Coordinator for War. Last week's article considered the entire organization. This and succeeding articles will deal with the separate divisions, and the breakdown of their duties. The production division is charged with the responsibility of making certain there is an adequate supply of oil to win the war.

Problem Complex

But simply holding down drilling to a given figure of steel consumption is far from the major worry of the Production Division. Its obligation is to see to it that available reserves of crude are sufficient for all demands during the war. Right now there is sufficient production for all demands, though not all of it is in the right places, but if the war should last a long time this might not be true. Just because the proven oil reserves of the United States are 14 times the present annual rate of production does not mean that we could keep up the present rate for 14 years, because it may take 50 years to get all the oil out of many fields. Some fields are already producing beyond their efficient rate, which means that their production will fall off in the near future and that new reserves must be found if the country's production is to be maintained. So while the Production Division is holding down drilling in some fields it is constantly fighting for more steel for wildcatting and exploratory drilling, competing with all the other steel-consuming interests which are seeking allocations from the WPB. The Production Division, of course, can't determine that steel should be denied a tank arsenal or a shipyard and given to wildcatters, but it insists, with great positiveness, that more reserves must be located soon if the Army and Navy are going to have the oil necessary to fight a long war.

One periodic task of the Production Division is to issue monthly certifications of production rates for each oil state. Prior to January, the Bureau of Mines issued a monthly forecast of demand, which was used as a rough guide by state regulatory authorities in fixing production allowables. The bureau still makes its demand forecasts but they are not made public. Instead these forecasts, together with information supplied by the Army and Navy and other agencies, are used by the Production Division in drawing up its monthly certifications. Occasionally these certifications have to be changed in the course of the month, due to new developments. Since March the rates have included natural-gasoline and condensate production in addition to crude.

For the most part the state authorities follow the monthly certifications far more closely and conscientiously than they did the Bureau of Mines forecasts. A notable exception is Mississippi, which makes no serious attempt to keep production within the certified rates. The Production Division has seriously considered certain measures within its power to force Mississippi into line though it has not yet decided to adopt them.

Last spring Texas strenuously objected to its production rate one month and finally set its allowables higher than the certification. But the Production Division's certification was based on secret military information which it could not reveal even to the Texas authorities, and subsequent events proved that its certification, while slightly low, was justified.

Much closer cooperation with the oil-producing states has been achieved through the National Conference of Petroleum Regulatory Authorities, which the Production Division was instrumental in forming. Although this group has assembled in Washington only twice, the organization has resulted in certain reforms in state regulation, has improved statistical reports, and has contributed materially in obtaining the cooperation of the states in effecting a better balanced distribution of the total production quota of the United States.

In addition to its monthly certification of production rates, the Production Division makes a continuous forecast of the productive capacities of the oil wells and fields of the entire country in order to determine the extent of development required to assure a continuous and adequate supply of crude and the amounts of critical materials required for such development. This study is well advanced, and the data will be used when needed in apportioning steel and in guiding the location of new drilling and wildcatting.

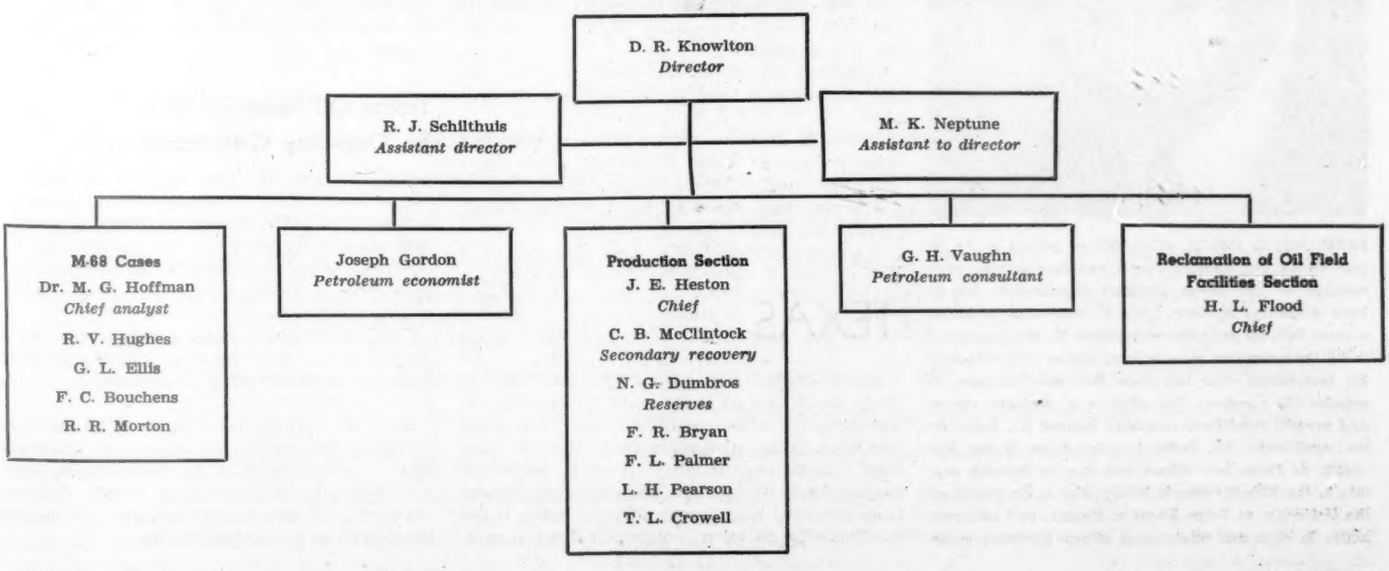
New Function of Division

A new activity of the Production Division is its section of Reclamation of Oil Field Facilities, just getting organized. The division has cooperated with the Materials Division in conducting surveys of materials and requirements and the inventories of tubular goods and other material and equipment essential for production purposes. Now it is starting a survey of oil-field facilities which can be reclaimed for superior uses. For example, in some closely-drilled fields like East Texas where each well produces only a fraction of its potential it may soon be necessary to require that certain wells be pulled and the pipe and equipment be used elsewhere. It is anticipated that allowables presently assigned to the wells to be shut down will be transferred to the other wells on the same lease. The data from these surveys which are now getting under way will permit more efficient use of available equipment and will have an important bearing on determining the needs that must be furnished through manufacture of new goods.

In all of its surveys the Production Division relies heavily on other government agencies, on the state governments, on its district offices, and particularly on the oil industry. It has made very few demands on the industry for information of a sort not already being compiled, but by drawing on available data it has at its command, in spite of its small staff, more information about

(Continued on Page 33)

Unofficial Organization Chart of the Production Division of the Office of Petroleum Coordinator



STATE CAPITALS...

KANSAS

SEPTEMBER ALLOWABLE of 731,000,000 cu. ft. daily from the Cunningham field of Kingman and Pratt counties was assigned last week by the Corporation Commission. At the same time, the commission established allowable of 450,000,000 cu. ft. daily for the Otis gas field in Rush and Barton counties.

THE CORPORATION COMMISSION was about ready to issue a new proration order covering the Kansas portion of the Hugoton gas field when the War Production Board issued Supplementary Order M-68-6, prohibiting further development, except on special authorization. The contemplated order would have created five zones for proration purposes. Purchaser nominations would have been the determining factor in establishing allowable for each zone.

Officials of the Corporation Commission have been cooperating with representatives of the Oklahoma regulatory body in a joint study of the Hugoton field.

The Kansas commission, several years ago, issued a conservation order on the Hugoton field, restricting production to less than 10 per cent of potential. Operators obtained a restraining order preventing enforcement of the regulation.

Current production from the Kansas side of the field is about 1.5 per cent of potential and total withdrawals have been around 245,000,000,000 cu. ft. Oklahoma producers have withdrawn about 21,000,000,000 cu. ft.

OFFICE CONTESTED . . .

***BEAUFORD H. JESTER**, of Corsicana, winner of the recent Democratic primary runoff and now serving as a member of the Texas Railroad Commission, having been appointed by Gov. Coke R. Stevenson, is facing a court fight for retention of his post. He was appointed to fill the unexpired term of Jerry Sadler who withdrew his resignation after Governor Stevenson declined to appoint his nominee. The office was declared vacant and several candidates competed against Mr. Jester for the nomination. Mr. Jester is a graduate of the University of Texas law school and was an infantry captain in the 90th Division in World War 1. He served on the University of Texas Board of Regents and has been active in civic and educational affairs for many years*

CALIFORNIA

THE UNITED STATES TARIFF COMMISSION study of production costs has been extended to include all heavy crude-oil fields in the state, according to the California Stripper Well Association which was requested last week by the commission to notify its members of the increased scope of the study.

The tariff group recently mailed questionnaires to operators of a small number of heavy crude-oil fields in the state. The enlarged list of fields is intended to supplement and not replace fields specified in the original letter of request. The period for which costs of crude-oil production is under study is from October 1941 to July 1942.

Additional fields from which cost data are now sought by the federal commission are: Santa Maria Valley; the coastal region, including Casmalia, Cat Canyon, Los Flores area, Gato Ridge, Lompoc, and Orcutt; Brea Olinda; Huntington Beach; Inglewood; Richfield; Torrance-Hermosa; Wilmington; East and West Coalinga; Coffee Canyon-Round Mountain; Edison; Elk Hills; Fruitvale; Kern River; Kern Front; Lost Hills, including Williamson; McKittrick; Midway Sunset; Mount Poso; Poso Creek; Montebello; Belridge North and South, and Santa Fe Springs.

Producers are requested to submit production-cost data, not later than September 22, 1942, to the U. S. Tariff Commission, on forms provided for this purpose.

Additional forms for submission of these data may be obtained from the U. S. Tariff Commission.

Robert A. Donovan of the Office of Price Administration and James V. Brown, senior petroleum specialist, U. S. Tariff Commission, are in California aiding operators with reports and directing assembly of data.

TEXAS

ASSIGNMENT OF NEW-POOL allowable to Shell Oil Co., Inc., 1 Sealy Smith Foundation, an Ellenburger producer in Ward County, was asked last week in an application filed with the Railroad Commission. Ralph U. Fitting, petroleum engineer for Shell, said production is coming from fractured Ellenburger dolomite below 10,000 ft. There is no other production from a comparable depth within 300 to 400 miles, Mr. Fitting testified.

The Shell discovery was officially gaged August 6 and 7. It flowed 2,852 bbl. of 47-gravity clean oil through 2-in. tubing from a plugged-back depth of 10,364 ft. Hole was originally drilled to 10,545 ft.

NEXT STATE-WIDE hearing will be held by the Railroad Commission at Austin September 17. Testimony on demand and physical-producing conditions will form the basis for the October proration schedule.

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Walter Teagle Resigns From Defense and Labor Boards

WASHINGTON, D. C.—Walter C. Teagle, chairman of the Standard Oil Co. (New Jersey), has resigned from the National Defense Mediation Board and the War Labor Board after serving continuously for 1½ years as an employer member of the agencies. H. B. Horton, treasurer of the Chicago Bridge & Iron Co., has been appointed to succeed Mr. Teagle.

"Having served for 1½ years," William H. Davis, chairman of the board, said in announcing the Standard chairman's resignation, "Mr. Teagle feels that he has done his turn and that there is a real advantage in having some other representative of industry become familiar with and participate in the work of the board."

Wage and Hour and Public Contracts Divisions Consolidated

An order consolidating the Wage and Hour and Public Contracts divisions of the U. S. Department of Labor, to become effective October 15, has been issued by Miss Frances Perkins, secretary of the U. S. Department of Labor in Washington.

Under the order the duties and functions of the Division of Public Contracts and its personnel are combined and consolidated with those of the Wage and Hour Division, and both will be under the direction of L. Metcalfe Walling, administrator.

The title of the new organization will be the Wage and Hour and Public Contracts Division of the U. S. Department of Labor.

"Administration of the two acts will be conducted from the present field offices of the Wage and Hour Division," Mr. Walling continued. "The functions of the Public Contracts Division, or Walsh-Healy Act, will be decentralized to the regions in the same manner that functions of the Wage and Hour Division were decentralized 3 years ago."

Texas Oil Meeting Will Be One-Day Gathering

DALLAS, Tex.—A 1-day, streamlined war meeting of Texas oil men will be held in Dallas on October 9, in place of the usual 3-day convention held annually by the Texas Mid-Continent Oil and Gas Association, according to an announcement by George C. Gibbons, executive vice president of the association.

This year's annual meeting will be devoted to serious discussion of Texas oil-industry problems and the important place it occupies in the nation's war effort.

Many oil men are planning to be in Dallas on Saturday, October 10, to attend the Oklahoma-S.M.U. football game at the Cotton Bowl, which will afford an opportunity to devote Saturday morning to committee meetings and post-convention activities of the association.

The OIL AND GAS JOURNAL

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One Responsibility

Complaints from all parts of the country which are rapidly becoming insistent, are demanding that war responsibilities be centered in a few competent hands.

The public has tired of the combination of cheap politics and scattered authority with the inevitable buck passing and delays. The man-in-the-street is thinking in terms of adequate home support for the armed forces which are now on several battle fronts and which will be expanded manyfold throughout the entire world, provided they have the required supplies and equipment.

As this coordination and centralization of war efforts are forced on Washington, oil operators must insist that they include every phase of petroleum activity. No essential war enterprise has suffered more because of the division of governmental powers.

There are more than 50 war agencies, separate departments, bureaus, and military branches which have contacts with the petroleum industry. Many oil companies are weekly transacting business or making reports to 25 or more of these governmental units.

These companies know what happens under this policy of divided authority. Rulings and requests are often in conflict or duplicate each other. Managements cannot establish efficient operating programs even for brief periods, and they are confused as to what will be required of them next month and next year.

In most instances the agency or bureau which makes investigations and gathers information regarding the industry as a basis for future war operations has no part in making the final decisions as to what will be done. In effect, the principal operating policies are established by outside agencies too often influenced by extraneous matters which lead them far astray in determining how best this industry can serve.

Apropos of this situation, what has happened over the past 9 months has emphasized the interrelationship that exists among all divisions of the oil industry's operations. Curtailment in tanker operations has affected the producer in Wyoming, the refiner in Chicago, and the retailer at Kokomo, as well as those operators which look to water shipments for the movement of products.

The truth of all this has been demonstrated numerous times in the direction of petroleum operations from Washington in recent months. The work of the Office of Petroleum Coordinator and the affiliated committees from the industry, has often been wholly or partially nullified because the final say rests with other agencies which are not informed as to what needs to be done and insist on ignoring the recommendations of those who do.

Every adjustment in operations to conform to war requirements has a bearing on costs. Yet OPC has no control in these matters. That agency has directed refiners to reduce their gasoline yields and increase the output of lower priced products. It has brought about the use of costly transportation facilities. Crude production has been expanded in some areas and contracted in others. There has been a general disruption of distribution channels and many manufacturing operations have been completely changed in order to expand the production of war materials. But the fundamental matters of compensation and materials with which to do these things, is determined by others.

The industry's leaders are in agreement that the answer lies in expansion or reorganization of OPC to include many of those functions now exercised by other agencies. The industry's war control must be coordinated, starting with the required exploratory and drilling operations to assure adequate supplies throughout the emergency and extending through transportation, manufacturing, and marketing operations.

Petroleum's war operations—daily more indispensable—must be made one responsibility.

More Data Asked on PIWC Study of War's Impact

WASHINGTON, D. C.—The Petroleum Industry War Council last week sent back to its temporary committee on the impact of the war on the petroleum industry the report on which this group of 12 has been working for 2 months. A revised report is scheduled for submission to the PIWC at its October meeting.

Although there was general agreement with the committee's findings that orders and regulations of government agencies have increased the cost of the oil industry beyond its ability to recover them through increased prices, the committee was instructed to make further studies of some phases of operations.

During the council's discussion of the report it was inferrentially criticized by Frank Buttram, Oklahoma City, Okla., president of the Independent Petroleum Association of America and a member of the special committee. Mr. Buttram said that the production branch of the industry is being treated as a stepchild and that the council would be derelict in its duty if it does not take steps to see that additional reserves are discovered soon.

Exploration Study Inadequate

This was understood to indicate that the committee's report did not give sufficient consideration to costs of exploration and production.

"In my judgment," declared Mr. Buttram, "the Petroleum Industry War Council at its last meeting took an excellent forward step in authorizing the appointment of a temporary committee on the impact of the war on the petroleum industry. This committee has worked arduously under the leadership of Mr. Gill on the preparation of a report and the statements made here today are very timely.

"The discussions in the general report on marketing and refining prove conclusively that government aid must be given to such matters as increased transportation costs and increased costs on adjustments of refinery yields because of government directives as a result of the war impact.

"As a member of the temporary committee and as chairman of the subcommittee on production, I desire to say particularly that the Bureau of Mines report issued for release on August 24, 1942, gives some startling data and confirms the need for the study and action of this council on the temporary committee's report.

"The U. S. Bureau of Mines' report for field operations for June 1942, shows as the comparative figure oil wells completed for June 1941 to be 1,599 as against June 1942 of 726. That the initial production for the wells completed in December 1941 was 565,800 bbl. as against the initial production of wells completed in June 1942 of only 195,000 bbl., a decline of 65 per cent. That of the wells completed in December 1941, 23 per cent were dry holes and of the wells completed in June 1942, 33 per cent were dry holes. That the wells drilling at the end of December 1941 was 3,993 and the number of wells drilling at the end of June 1942 was 2,386. A decline of approximately 50 per cent of wells drilling.

"I quote from the Bureau of Mines report as follows: 'In total initial production and the ratio of dry holes the comparison was even worse. The initial production in June 1942 was only 35 per cent as large as in June 1941; whereas, the ratio of dry holes to total completions was 33 per cent compared with 23 per cent a year ago.'

"In other words there was a drop of over 50 per cent in completed wells in June of this year as compared with June last year and from the smaller number of wells completed in June of this year there was a relative increase of approximately 50 per cent in dry holes over a year ago. At this rate of decline in new production we will very shortly reach the vanishing point.

"When we really realize that we have a desperate war to win; when we realize that oil is ammunition; when we realize that the United Nations have already lost the Dutch East Indies and Burma in the Southwest Pacific area and the Maikop oil fields in the Caucasus; when we realize that the Germans are now definitely threatening the oil fields of Iran and Iraq and that they are already knocking at the door of the Grozny oil fields and that in a short time may overrun the great Baku oil fields; when we realize that the German submarines have already interrupted our crude-oil importations from Venezuela; when we realize all of these things it is easy to see that we may soon be called upon to supply practically the entire oil needs of the United Nations war effort from oil produced in the United States.

"Since, according to the Bureau of Mines report, our drilling activities have declined 50 per cent in the last 6 months and since our yield of new production per well in June 1942 has declined 65 per cent as against the production in June 1941, and since all of the producing states are producing at a maximum from a conservation standpoint with the probable exception of New Mexico, Texas and Louisiana and since without additional discoveries the production in Illinois will decline about 100,000 bbl. per day during 1942 it is clearly evident that we are not only drawing rapidly upon our known reserves but unless something definite is done soon to develop new oil reserves the petroleum industry will shortly be unable to meet the demands made upon it.

"Lastly, when we finally realize that out of consistent operations over a period of years it requires 5 years' time on the average from the time of starting surface explorations until the field is a substantial producing unit, we must lose our self-complacency about our ability to meet all demands that may be made upon us. Col. Ernest Thompson of the Texas Railroad Commission in Abilene last week stated very succinctly 'the exploration work started today will uncover the reserves needed 3 years from now.'

"This body is sitting as a group representing the petroleum industry. We are advisers to the Office of Petroleum Coordinator. If we are to perform our proper function, if we are not to be derelict in our duty to the petroleum industry, to the petroleum coordinator, to the war effort and to our Government, we must definitely notify all interested parties that additional oil reserves must be discovered in the near future and immediate steps must be taken to do this.

"As unpleasant as it is, we must face the facts and the proper government authorities must realize that we cannot possibly place a new stock of oil reserves on the counter at the present prices for crude oil. No amount of figuring with pencils will be able to determine how much will be required to provide these essential reserves but whatever that amount is it must be authorized by proper government officials before it is too late.

"Some of the members of this council and even some governmental authorities have treated the production branch of the petroleum industry as a stepchild, but in reality it is the foundation and root of the petroleum family."

Inventory, Equitable Spread of Supplies Are Endorsed

WASHINGTON, D. C.—Creation of committees on materials and supplies in each of the five OPC districts, inventory of significant equipment and distribution of available materials on an equitable basis to all producing units were steps proposed last week by the Petroleum Industry War Council.

"In the prosecution of the war," the council's resolution on these matters declared, "it is essential that all necessary materials and supplies required for the exploration and production of petroleum be made available on an equitable basis to all producing units of the petroleum industry wherever possible."

The petroleum coordinator was requested "to create immediately in each of the five coordinator's districts a committee on materials and supplies, the membership of which will be recommended by the general district chairmen."

The council proposed "that the several committees acting in their respective districts" should "cause to be prepared and submit to the Office of Petroleum Coordinator for War estimates of the future materials requirements, so that the Office of Petroleum Coordinator for War and the War Production Board may properly adjust the flow of materials from manufacturing sources."

The materials and supply committees, according to the council's proposal, would be directed to survey and inventory in their respective districts all tonnage and significant materials at the earliest possible date.

The PIWC resolution left undefined the depth of the inventory on materials and supplies which was one of the points in the so-called Huff plan that incited most vigorous opposition. Certain groups in the production branch of the industry recognize the desirability of definitely determining the amount of supplies in the warehouses and equipment yards. There is wide disparity, however, in the opinions on what items should be included in an inventory of supplies. Some favor inventorying only the large items such as drill pipe and casing. Others favor a middle course and still a third element contends that everything above a minimum value of $10, or a similar arbitrary figure, should be tabulated.

Decision of the PIWC to delve into the supply inventory problem and the recommendation that committees determine actual requirements and arrange equitable distribution of materials now on hand indicates that a change in P-98 is imminent. The industry's blanket priority order, P-98, is scheduled to expire September 15.

Drilling in Illinois May Rise 75 Per Cent Next 4 Months

By HERNDON DAVID

BECAUSE of the recent modification of M-68 by the War Production Board as applied to Illinois, Indiana and Kentucky (The Oil and Gas Journal, Sept. 3, 1942, p. 17), Illinois drilling will be increased approximately 75 per cent during the balance of the year, a preliminary survey indicates. At the completion rate prevailing since the original M-68 became effective, there would have been approximately 400 tests completed between now and December 31. Under the modified order completions may be boosted to approximately 700.

Originally, it was estimated that there was enough equipment on hand in the Illinois basin area to permit the drilling of 3,000 tests and that the effect of the modification would be extensive. Some anticipated that the order would precipitate a drilling boom comparable to that in 1940 when more than 100 tests were completed each week and that 1,500 tests would be completed during the balance of the year.

The order permits drilling of wells to sand horizons at depths greater than 2,500 ft. on 20-acre spacing and drilling of sand wells to 2,500 ft. or less on 10-acre spacing. There is no relaxation on the 40-acre spacing of wells producing from lime, regardless of depth. The revised order, M-68-5, contains restrictions which make it almost impossible to find a drilling site in fields developed since start of the year. In addition, there is the problem of equipment. Producers who lack the necessary equipment are prohibited from using priorities for M-68-5 operations.

While the drilling increase permitted under the order may cushion the decline in oil production from Illinois, any increase in output will be comparatively small unless a new prolific pool is uncovered. As most of Illinois' big flush production has come from lime fields, the new order is likely to be of little benefit in increasing the state's output.

Whether an increase in Illinois output at this time would be of any benefit to the rationed areas is uncertain. The peak in railroad transportation of oil beyond Illinois is being approached and a wide-open drilling campaign, such as was hoped for by many Illinois producers, which would have boosted the state's oil production 30,000 to 50,000 bbl. might not be of much benefit to the East Coast.

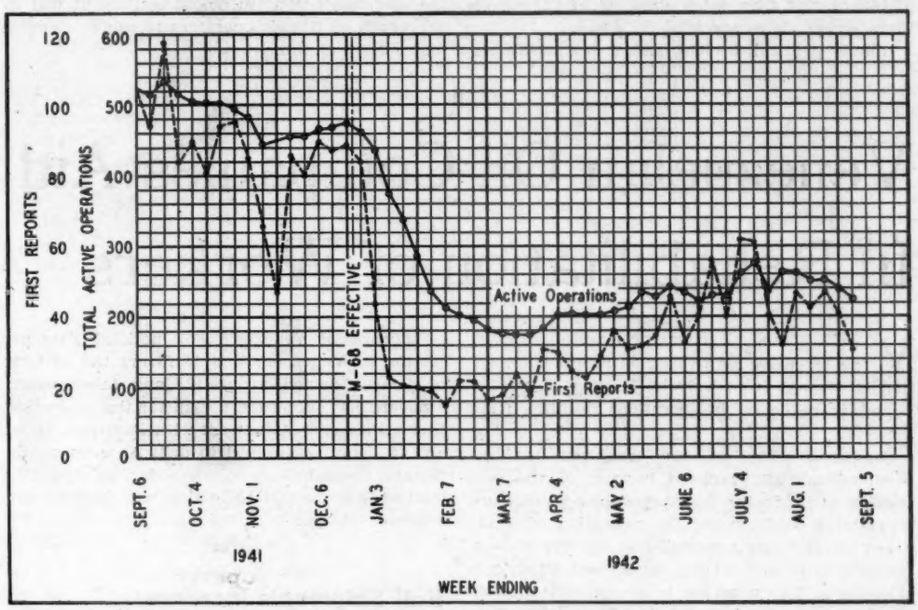
Previous Spacing Thwarts Drilling

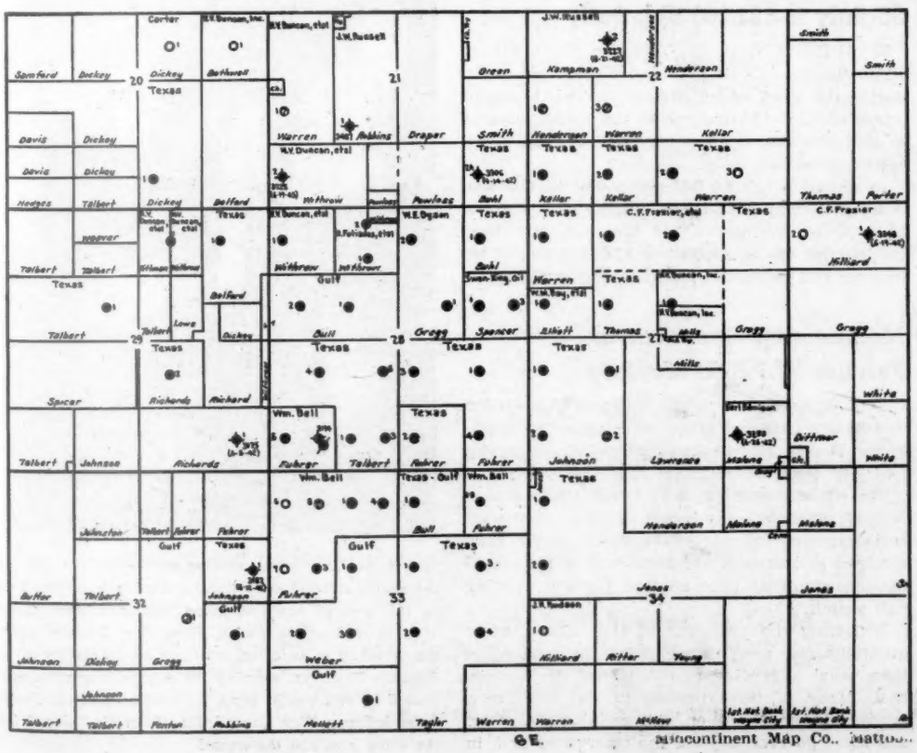
Principal obstacle to the drilling of more pool wells under the 20-acre modification is the spacing generally followed since the issuance of M-68 last December. The modified order provides that wells to 2,500 ft., or lesser depth, may be drilled on each 10 acres, if the location is 466 ft. from any drilling or producible well. Below 2,500 ft. one well may be drilled to each 20 acres, if the location is at least 900 ft. from any existing producer. Wells must be 330 ft. from the property line and not on acreage attributable to any other well.

On a lease or field drilled on 40-acre spacing with the wells in the center of the tracts, there could be no additional drilling. However, most of the Illinois development in recent months has been on 40-acre spacing with the wells located on alternate 20-acre tracts. This places the well 330 ft. from one boundary and 660 ft. from the other line and a well cannot be drilled on the 20-acre tract which is undeveloped because there would then be only 660 ft. between wells.

Even in cases where operators might have been permitted to drill wells in the center of the corner 10 acres of the 40-acre tract, there would still be no relief because a location in the diagonal corner would be approximately 737-ft. distant.

An illustration of the effect of the order is shown in the accompanying map of the Sims pool in Wayne County, Illinois. This is one of the best recent pools in Illinois and it has been drilled mostly under M-68. It produces from the Aux Vases sand at approximately 3,100 ft. More

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drilling in the pool would boost its production substantially. However, no drilling can be done under the recent amendment which the previous regulations prohibited.

In pools producing from above 2,500 ft. in Illinois, Indiana and Kentucky, the order will have some practical applications. There are 72 pools in Illinois which produce from sands above 2,500 ft. but only a few are undergoing development (Boulder, King, South Lawrence, Roland, South Maunie and Bible Grove). Most of the older ones are drilled up and little more development can be expected.

Most operators interested in the area point out that confusion will result from the order, particularly when some fortunate company having a considerable stock of equipment in the field drills a well and the offset operator cannot find the necessary equipment to offset. There is also some question as to whether there can be any transfer of inventories from other districts to Illinois or the adjacent states specified in M-68-5.

Illinois political leaders and a few operators were reported this week in Washington, D. C., to be dissatified with provisions of M-68-5. Members of the Illinois congressional delegation assert that the Office of Petroleum Coordinator broke faith on a commitment made last July when Senator Lucas agreed to withdraw legislation which would have prevented federal agencies from enforcing well-spacing limitations.

Members of the petroleum coordinator's staff called attention to remarks of Senator Lucas published in the Congressional Record July 16, 1942, in which he said:

"The only thing we expected to do was to use the steel that is in the Illinois oil area at the present time."

This quotation, made as part of the explanation for withdrawing the amendment, OPC contends, was the nucleus of an agreement to reconsider the Illinois spacing problem. Order M-68-5 was recommended to the War Production Board on the declaration that sufficient equipment was in the hands of Illinois operators to supply requirements for 5 or 6 months.

Venezuelan Oil Companies Aid In Rehabilitation of Workers

VENEZUELAN oil companies have launched an extensive agrarinization program for nationals severed from payrolls because of the involuntary reduction in operations resulting from the war.

Companies whose personnel requirements have been substantially reduced because of the contraction in producing and shipping operations are cooperating in financing the relocation of workers. This is being accomplished by special concessions in severence pay, loans, and other considerations. The program is a cooperative effort by the oil companies and the Venezuelan Government to maintain the living standards of petroleum workers somewhat near the level to which they became accustomed while employed by private industry.

It is impossible to determine, under present conditions, how long the enforced period of curtailed operations will last. Consequently, the companies and the Venezuelan Government agree that it is not practical or desirable to maintain idle workers in the oil camps where other channels of employment are not available.

Exploitation operations have been reduced in approximately the same ratio as production and shipping, or about 50 per cent, from the high rate prevailing at the start of the year. Exploratory drilling has not suffered proportionately but even this phase of operation is curtailed.

There is a moderate volume of exploitation in the eastern Venezuelan fields including Jusepin, San Joaquin, El Roble, Leona, and Santa Ana. Texas Co. (Venezuela), Ltd., is continuing its exploratory work in the Guayabo area of Guarico.

More than 30 producing wells have been completed in the Santa Barbara field, developed by Compania Consolidada de Petroleo which is now making regular deliveries through its 10-in. line terminating on the northern coast at Puerto la Cruze. Exploitation in the Santa Barbara field is following an eastward trend and it is possible, although not yet proven, that the productive zone will extend uninterrupted to the Jusepin field, 7 miles northeast, operated by the Standard Oil Co. of Venezuela.

Standard of Venezuela has notified Pantepec Oil Co. of Venezuela that it favors the division of jointly owned properties and other assets. Standard has submitted a plan for the separation. Under the original contract with Pantepec, Standard of Venezuela agreed to drill 20 wells on the former company's concessions for an operating interest. The 20-well obligation was fulfilled several months ago.

Rail Shipments Increase Slightly to 823,260 Bbl. Daily

WASHINGTON, D. C.—Tank-car shipments of oil to the East Coast averaged 823,260 bbl. daily during the week ended August 29. This is an increase of 5,180 bbl. daily over the volume moved in the previous week, when car loadings averaged 817,980 bbl. daily.

In shipping 823,260 bbl. each day to the seaboard, 34 companies loaded 27,442 cars. On the basis of an average of 210 bbl. per car, these cars carried the equivalent of 5,762,820 bbl. of petroleum and petroleum products during the week.

Membership Questions to Feature W.P.R.A. Meeting

The Western Petroleum Refiners Association will hold a technical group meeting at the Washington-Youree Hotel, Shreveport, La., beginning at 4 p.m. September 11.

The entire meeting will be devoted to a discussion of questions sent in by members of the association. Approximately 50 questions have been received and as many of these will be presented for discussion as time allotted for the meeting will permit.

Reflecting the problems of the refiner, these questions are even more varied in their scope than usual, according to officials of the association. Many of them pertain to the war emergency and its effect on the refining industry; and some go even beyond the emergency and, in a speculative sense, delve into the possible eventualities of the postwar period.

These questions-and-answer meetings, held in the Shreveport area for the past several years, have proved more popular than any other type of meeting among technical men. Through this medium refiners are afforded opportunity to discuss openly, frankly and thoroughly their manifold problems.

A. W. Trusty, chief chemist of Arkansas Fuel Oil Co., who has served with signal success as chairman of previous sessions, will preside at the September 11 meeting.

PIWC Refining Committee Opposes Octane Restriction

Opposition to restrictions on the octane-number specification of motor gasoline, at least until necessity for any such limitation is proven, was voiced in Washington, D. C., last week in a resolution adopted by the Petroleum Industry War Council.

The refining committee proposed the resolution later adopted by the council after rumors circulated that the War Production Board was considering a tentative order restricting the octane rating of automotive fuel and setting up other limitations on the type and quantity of gasoline service stations could store.

New Kansas Line Authorized

WASHINGTON, D. C.—The Federal Power Commission granted Northern Natural Gas Co. temporary certificate to construct 31 miles of 30 and 24-in. loop in Kansas and three additional pumping units.

The oil industry is still making meritorious awards for the rubber-salvage drive while assuming a leading role in the general scrap-collection campaign now under way throughout the nation. Here, Earl Godwin, radio commenator, is inducted into the honorable order of Western Cowboys, wearing the appropriate attire presented by William R. Boyd, Jr., chairman of the Petroleum Industry War Council. Mr. Godwin's "plugs" for the drive won him the award

OPC Production Division Has Duty of Insuring Oil Supply

(Continued from Page 25)

oil production in this country than has ever before been available in one place.

Several of the OPC formal recommendations or directives were issued at the instance of the Production Division and are administered by it. Among these are:

Recommendation 13.—Providing for the more efficient and less wasteful development and production of condensate fields.

Recommendation 19.—Distributing the monthly production quota for California among the several pools and wells.

Recommendation 28.—Fostering the maximum efficient production of aviation gasoline grades of crude oil, particularly in Texas where so many aviation-gasoline refineries are located.

Recommendation 47.—Designed to prevent the premature abandonment of oil and gas wells with attendant loss of stripper reserves. While the Production Division did not originate this recommendation it administers it by passing on applications for abandonment. To date 403 applications have been received and only 6 denied.

One interesting study just completed by the Production Division concerns the possibilities of subsurface storage of gasoline. With the probability of the continued shrinkage in demand for motor gasoline it was considered essential to anticipate the problem of disposing of surplus gasoline necessarily made by refineries producing fuel oil, lubricants, and petroleum war products. A broad and detailed study was made, and the division is prepared to recommend certain procedures for returning surplus gasoline to abandoned wells and producing oil fields from which it can be recovered later.

Methods of secondary recovery of oil are under constant study by the Production Division. One aspect of this is the priorities for materials and other assistance given the Bureau of Mines in establishing a field laboratory in Pennsylvania for the purpose of studying and fostering secondary recovery in the eastern producing areas.

The price of crude oil has an important bearing on production and exploration, and while prices are not within the immediate jurisdiction of the OPC, the Production Division works constantly with the Office of Price Administration on this matter. It cooperated with the U. S. Tariff Commission in organizing a survey of the costs of producing crude oil, to be used by OPA in making price adjustments, and it analyzed the commission's preliminary report and made suggestions for improvement which are now being followed in bringing the report up to date. In addition the Production Division has made its own independent studies to correlate the influences and effects of prices on the production, movement, and disposition of crude oil of various grades.

The Production Division, while a functioning unit by itself, cooperates closely with the other divisions of OPC in solving mutual problems. This is particularly true with regard to the Refining, Transportation, and Petroleum Supply divisions in maintaining an adequate supply of crude oil for refineries producing war products. Together with the rest of OPC the Production Division maintains liaison with the Army, Navy, and other federal war agencies.

Oil producers from all over the country constantly call on their friends in the Production Division, and in Room 7410 of the New Interior Building they are cordially welcomed by Mr. Knowlton's secretary, Mrs. Blanche Chapman, formerly with the Sunray Oil Co. at Tulsa.

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National Petroleum Association Announces Fall Program

Deputy Coordinator Ralph K. Davies heads a group of four OPC officials who will address the members of the National Petroleum Association attending the three-day meeting of the group beginning on September 16 at William Penn Hotel, Pittsburgh, Pa. The four officials are, in addition to Mr. Davies, Bruce K. Brown, assistant deputy coordinator; Robert T. Collier, director, Marketing Division; and Greer W. Orton, director, Materials Division. In addition, Gen. W. B. Pyron, liaison officer for petroleum of the War Department, will address the gathering.

The complete program follows:

GENERAL SESSIONS

Thursday, September 17

Urban room—2:00 p.m.

President's address—N. H. Weber, N.P.A. president.
The Association's Fortieth Anniversary, E. M. Lyons.
Appointment of committees.
Speakers—
Ralph K. Davies, OPC deputy petroleum coordinator.
Bruce K. Brown, OPC assistant deputy coordinator.
Robert T. Collier, OPC marketing director.
Greer W. Orton, OPC materials director.
Report of nominating committee.
Election of trustees.

Thursday evening, September 17

Fellowship supper—Urban room—6:30 p.m.

Friday, September 18

Urban room

(Breakfast 8:30 a.m.—Program begins at 9:30)

Speakers—
Gen. W. B. Pyron, liaison officer for petroleum, War Department.
John D. Gill, Atlantic Refining Co.; chairman, PIWC committee on impact of war on the petroleum industry.
Hallett Abend, New York Times' chief far eastern correspondent 1926-1941.

GROUP SESSIONS

Wednesday, September 16

10 a.m.—ODT tank-car service committee, J. S. Wood, chairman.
2 p.m.—A.P.I. lubrication committee, L. C. Welch, chairman; R. A. Ludlow, secretary.
2:30 p.m.—Western Pennsylvania Refiners Traffic Association, L. L. Gamble, president. (Time subject to change.)
6 p.m.—Executive committee, Department of Fire and Accident Prevention, H. A. Johnston, president. (Time subject to change.)

Thursday morning, September 17

9:30 a.m.

10 a.m.—Department of Traffic and Transportation.
10 a.m.—Department of Manufacture.

Tank Trucks Exempted From ODT General Order 6

WASHINGTON, D. C.—A general permit exempting tank trucks from the provisions of General Order ODT 6, as amended, was issued September 3 by the Office of Defense Transportation. The effective date of the order with respect to such vehicles previously had been postponed. Order 6, to which the permit applies, governs local delivery operations of common carriers.

Sun and Bethlehem Yards Launch Four New Tankers

WASHINGTON, D. C.—Four new tankers were included in the 68 new merchant ships completed in American yards during August, the Maritime Commission announced last week. Three new tankers were completed by Sun Shipbuilding & Dry Dock Co., Chester, Pa., and the other was built at the Baltimore yards of Bethlehem-Sparrows Point Shipyard, Inc.

Standard of Louisiana Posts First Price in Lake St. John

SHREVEPORT, La.—Initial posting by Standard Oil Co. of Louisiana for crude in the Lake St. John field, Concordia Parish, Louisiana, became effective September 5, ranging from $1.35 to a low of 86 cents, depending on gravity and depth of the pay.

Production from 3,500 ft., below 20 gravity is posted at $1.03 with a 2-cent differential for each degree of gravity to a top of $1.35 for 40 gravity and above.

Oil from the 4,500-ft. pay, below 25 gravity is posted at 86 cents with 2-cent differential for each degree to a top price of $1.18 for 40 gravity and above.

The company statement said that this is the initial posting for this crude and is subject to disapproval by the Office of Price Administration.

DEATHS

MILO MELLVILLE ORR, 46, district geologist at Laredo, Tex., for 19 years, died at his home last week. A 32nd degree Mason, Mr. Orr served as engineering officer in the first World War. His widow survives.

CARL W. BROWN, 70, a retired oil man who pioneered in the development of oil fields in Louisiana, Texas and California, died at an Oklahoma City, Okla., hospital after an illness of 2 weeks. Mr. Brown had lived in Oklahoma City for 20 years. He retired 15 years ago. His widow survives.

JOHN ELI BRUNNER, 60, former oil-field worker in Pennsylvania, died at his home at Daytona Beach, Fla., after a lingering illness. His widow and a daughter survive.

CLARENCE J. WALKER, 71, retired oil man, died in an Anaheim, Calif., hospital, August 24, death being attributed to pneumonia. Mr. Walker was born in Butler County, Pennsylvania, and followed the oil business around the world. During the first World War he was superintendent for Nobel Brothers in the Baku oil fields of Russia, and later was associated with Dutch-Shell in Burma and Sumatra. He retired in 1935.

JOHN EDWARD BARR, 63, who for 30 years was associated with Kendall Refining Co., Bradford, Pa., died at his home in Bradford last week. Two daughters survive.

FRANK PIERCE, 69, who had worked in the oil fields of Clarion County, Pennsylvania, for 40 years, died last week in an Oil City, Pa., hospital. He had been ill for several months.

BILL BROCKOVER, 62, oil man of Borger, Tex., died last week following a long illness. Mr. Brockover went to Borger in 1926 as an oil-field worker.

JOHN B. NICHLOS, wealthy Oklahoma oil operator and political figure, died last week from burns received on his farm near Chickasha, Okla. Mr. Nichlos came to Oklahoma from Omaha, Neb., in 1920, and began prospecting for oil. He was said to be a close friend of Herbert Hoover and Patrick Hurley. His widow survives.

EDWARD R. PRICE, 54, who had been connected with the oil business at Pittsburgh, Pa., for more than 25 years, died last week at his home in that city. For the past 8 years, Mr. Price had been with the American Oil Co., in the sales department.

Natural Gas News

OPA Pledges Aid in Fight Against Higher Ohio Gas Rate

Permission to intervene on the side of the city of Cleveland in opposition to the effort of the East Ohio Gas Co. to obtain higher gas rates in that city will be sought by the Office of Price Administration, Leon Henderson, administrator, decided last week.

This intention was revealed in a letter sent by Mr. Henderson to Mayor Frank J. Lausche, of Cleveland, in response to the latter's request that OPA cooperate with the city authorities in their efforts to prevent a rate advance in a proceeding now pending before the Ohio Public Utilities Commission.

"This office," Mr. Henderson wrote the Cleveland official, "will support you in your efforts to prevent any increase in the price of gas sold in your city. We propose, therefore, within a short period to seek the consent of the Ohio Public Utilities Commission to intervene in this proceeding for the purpose of aiding you in maintaining the ordinance rates established by your city as fair and reasonable rates for gas service. We may not find it possible to make a personal appearance, but in any event will seek permission to submit a brief to the Ohio commission."

Supplementary Order M-68-6 Prohibits Hugoton Drilling

WASHINGTON, D. C.—Cessation of drilling in the Hugoton gas field in Kansas and Oklahoma ordered last week was accomplished by Supplementary Order M-68-6. The order, in effect, suspends the automatic features of Conservation Order M-68 in so far as they may be applied to the Hugoton field. Under original terms of M-68, drilling of gas wells was restricted to a density of one well to each 640 acres but otherwise unhampered.

Supplementary Order M-68-6 was issued on recommendation of the Office of Petroleum Coordinator. Deputy Coordinator Ralph K. Davies explained that more than 20 wells which had been drilled in the Hugoton field are not being produced because they have not been connected to pipe-line facilities. The order will have the effect of requiring connection of these wells and thus make it unnecessary to use critical materials to drill additional wells until present productive potentialities are engaged.

El Paso Natural Hearing Postponed to September 30

WASHINGTON, D. C.—A Federal Power Commission hearing on proceedings resulting from a complaint by the State of Arizona against the Western Gas Co. and El Paso Natural Gas Co. (Docket G-242) and an investigation, instituted on the commission's own motion, of the same two companies and the El Paso Gas Transportation Corp. (Docket G-257) have been postponed until September 30. The Western Gas and El Paso Transportation companies are subsidiaries of El Paso Natural. The order of postponement transfers the hearing, previously scheduled in Washington, to Room 212, U. S. Court House at Phoenix, Ariz.

The investigation is to determine if the concerns are natural-gas companies within the meaning of the Natural Gas Act and whether the rates, charges, practices or contracts of those companies are unjust, unreasonable, discriminatory or preferential.

United Fuel Gas Rate Advance Suspended for Lack of Data

WASHINGTON, D. C.—The Federal Power Commission last week suspended a rate schedule submitted by the United Fuel Gas Co., Charleston, W. Va., which would increase rates for natural gas sold to the Louisville Gas & Electric Co., Louisville, Ky., and set public hearing on the matter for 9:45 a.m., November 9.

The order follows the company's failure to submit information required to justify the increased rate, as required by the commission's rules and regulations on the ground that compliance with the rules would require an amount of work out of all proportion with the business involved.

Consumption Continues At Rates Exceeding 1941

NEW YORK.—An increase of 9.4 per cent in the sales of natural gas in June was reported last week by the American Gas Association for June operations compared to a year ago. The increase in sales of natural gas during the first 6 months was 11.6 per cent.

The increases in June raised consumption for that month to 120,783,100,000 cu. ft. The volume was divided as follows: domestic, 23,897,900,000 cu. ft.; commercial, 7,302,600,000 cu. ft.; industrial, 65,921,700,000 cu. ft.; electric generation, 20,926,500,000 cu. ft.; and miscellaneous, 2,734,600,000 cu. ft.

Industrial consumption of natural gas during the first 6 months amounted to 427,206,100,000 cu. ft., or about 46 per cent of the total distribution. Domestic consumption accounted for 32 per cent of the total.

Natural Gasoline

Revised Codes on Sampling And Testing Issued by A.P.I.

Revised editions of A.P.I. Code 50-A and 50-B, covering measuring and sampling and testing natural gas and natural gasoline, respectively, have been issued by the American Petroleum Institute.

The revised editions were prepared under the general direction of F. E. Rice, chairman of the central committee on measuring, sampling, and testing natural gas and natural gasoline. B. R. Carney is chairman of the Group 1 subcommittee on natural gasoline, and George P. Bunn is chairman of the Group 2 subcommittee on natural gas.

The revised editions embody changes adopted at San Francisco, Calif., in November 1941, and subsequently ratified by letter ballot, including advancement of both codes from "tentative" to "final" status.

The second edition of Code 50-A includes new paragraphs covering measurement of gas at pressures above 1,000 lb. per sq. in., including orifice coefficients, as prepared by D. A. Sillers, Lone Star Gas Co., Dallas, Tex., chairman of subcommittee 2-B on gas measurement. In addition, this edition includes a method for determination of water vapor, and a clarification of the explanations regarding pressure base of 14.73 lb. per sq. in.

The second edition of Code 50-B includes two new sections on storage and measurement in spheroidal and spherical pressure-type tanks, prepared by the subcommittee to which this subject was assigned under the chairmanship of Paul L. DeVerter, Humble Oil & Refining Co., Baytown, Tex.

California's Natural-Gasoline Production Rate Gaining

LOS ANGELES, Calif.—Production of natural gasoline in California increased to 35,674 bbl. daily in July, a gain of 1,279 bbl. over the average output in June.

Kettleman Hills' seven plants produced 168,803 bbl., a daily average of 5,445 bbl., which was topped slightly by Long Beach operations where nine plants recovered 169,152 bbl. during the month, a rate of 5,457 bbl. per day. Ventura Avenue is the third largest producing district in California natural-gasoline operations. Five plants recovered 132,159 bbl. in July, a rate of 4,263 bbl. daily.

Details of July manufacturing operations, the number of plants and their daily capacity are shown in the accompanying table.

CALIFORNIA NATURAL-GASOLINE OPERATIONS, JULY 1942

	Natural gasoline prod. (gal.)	Plants operating: No.	Plants operating: Daily capacity*
San Joaquin Valley:			
Belridge	1,163,938	2	129,000
Elk Hills	52,367	1	10,000
Kettleman Hills	7,089,710	7	535,000
Midway-Sunset	2,089,306	5	40,500
Mountain View	211,265	1	6,000
Miscellaneous	2,075,792	9	169,300
Coastal district:			
Elwood	193,103	2	19,500
Santa Maria	512,815	3	11,500
Ventura Avenue	5,550,682	5	155,000
Miscellaneous	775,271	6	74,500
Los Angeles Basin:			
Brea-Olinda-Coyote	2,186,319	5	50,000
Dominguez	2,106,497	2	69,000
Huntington Beach	3,196,616	5	87,500
Long Beach	7,104,358	9	137,500
Montebello	1,287,586	2	105,000
Richfield	777,920	2	35,000
Rosecrans	1,227,413	4	54,000
Santa Fe Springs	4,331,947	5	125,000
Torrance	634,954	4	17,500
Miscellaneous	3,879,620	7	136,000
Total all fields	46,447,479	86	1,966,800

*Thousands of cubic feet.

Recycling News

Lone Star Now Operating Opelika Plant in East Texas

DALLAS, Tex.—Full operation of a recycling plant owned in partnership with Shamrock Oil & Gas Co. of Amarillo, Tex., in the Opelika field, has been taken over by Lone Star Gasoline Corp.

Lone Star officials had no information on the report that Shamrock's interest in the Henderson County, East Texas, recycling property had been acquired along with the transfer of operating responsibility.

The Opelika plant has capacity of 75,000,000 cu. ft. daily and has facilities for recovering 4,200 bbl. of condensate daily, along with 450 bbl. daily of butane and propane.

ENGINEERING *and Operating* SECTION

Reservoir Pressures at Rincon Stabilized by Gas Return

By NEIL WILLIAMS

Stabilization of reservoir pressures has resulted from the return of gas to producing sands of the Rincon field, Starr County, Texas, where Continental Oil Co. has been carrying on pressure-maintenance operations for the past 15 months. Vent-gas production is being injected into four of the field's nine oil-producing sands. Return of gas will be extended or shifted to other sands as additional gas becomes available.

FOR the past 15 months Continental Oil Co. has been carrying on reservoir pressure-maintenance operations in the Rincon field, Starr County, South Texas. At present gas is being returned to four of the field's nine oil-producing sands. Injection of gas into two of these sands has been undertaken only comparatively recently, and in them it still is too early to observe any conclusive physical benefits. In the other two sands, in which gas injection has been under way since the start of the project, reservoir pressures for some time have been stabilized at levels slightly above those existing at the beginning.

Approximately 1,299,000,000 cu. ft. of gas had been returned to the four sands up to August 1. This represented the total vent-gas production of the nine oil-producing sands from the start of operations except for the relatively small volume required for engine fuel and field use. Return of the gas now is at the rate of 5,500,000 cu. ft. daily, which is the capacity of the compressors provided for that purpose. Until the last several months, however, there has not been sufficient gas for the plant to operate at capacity, and at the start, and for a long time thereafter, operations were at less than half capacity. It has been only with the increase in field-gas production, due to steady development, that it has been possible to extend the return of gas to the two additional sands.

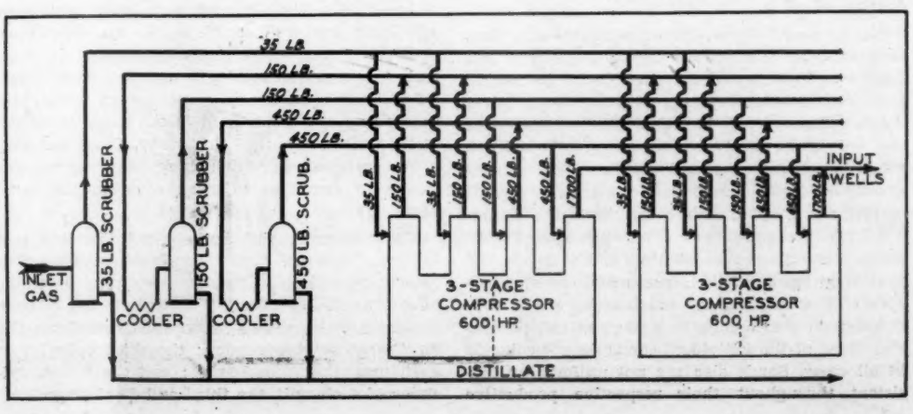
Sands selected for the return of gas are those from which withdrawals have been heaviest and in which pressure declines have been greatest. Development and production of the fields had been under way for some time prior to initiation of the pressure-maintenance project, allowing time for sizable production from several of the sands. Thus, with current gas output insufficient to balance withdrawals from all sands, the program has called for concentration of gas return to sands needing it most.

It is the plan that as pressures in these sands become stabilized and as additional gas becomes available through new development, the return of gas will be extended or shifted to other sands. By rotation of gas injection to the various sands as pressures in these sands decline, it is hoped that pressure drop in all sands can be kept at a minimum, thus prolonging the flowing life of the wells and increasing the ultimate recovery.

Depths of the nine oil-producing sands range from 3,600 ft. to 4,250 ft. The four sands to which gas presently is being returned are: the second ("D") oil sand at 3,700 ft.; the fifth ("G") oil sand at 4,000 ft.; the seventh ("I") oil sand at 4,165 ft., and ninth and deepest ("K") oil sand at 4,250 ft. Gas has been returned continuously since the start of operations to the first two above-named sands ("D" and "G" sands).

First recorded bottom-hole pressure in the D, or 3,700-ft. sand, was 1,590 lb. By the time the pressure-maintenance operations were started, the pressure had dropped to 1,520 lb. On May 1, after 1 year of operations and with 188,540,000 cu. ft. of gas having been returned to the sand, the pressure for some time had remained around 1,536 lb. Bottom-hole pressure in the G, or 4,000-ft. sand, had dropped from 1,764 lb. (first recorded pressure) to 1,665 lb. As of May 1, 401,812,000 cu. ft.

Schematic diagram of Continental Oil Co.'s pressure-maintenance plant in the Rincon field, Starr County, Texas



of gas had been injected, and pressure was 1,675 lb., at which level it had been for some time.

When gas injection was started in the I (4,165-ft.) sand, bottom-hole pressure was 1,375 lb., having declined 75 lb. from the pressure first recorded. Up to May 1, more than 173,450,000 cu. ft. of gas had been injected, and the rate of pressure decline had been substantially slackened, but the period of operation had been so short definite results had not been determined. A similar condition exists in the K (4,250-ft.) sand, in which only 25,500,000 cu. ft. of gas had been injected up to May 1.

In addition to the nine oil sands named, there are a number of other sands in which so far only gas and distillate have been found. For the time being, the latter sands are not being produced and no wells are being completed in them, pending installation of gas-cycling and distillate-recovery facilities. It is considered probable, however, that with development further down structure in these sands, they eventually will be proved productive of oil.

areas and, even within overlapping areas, all sands, due to shaling up at places, are not productive in all wells. However, most wells are capable of production in more than one sand, with some wells capable of production in as many as a half dozen sands. As yet limits of production have not been defined except in a few instances.

Sands range in thickness from 10 to 60 ft. and have an average thickness of 18 ft. Average permeability is 100 millidarcies. Average gas-oil ratio for all sands is approximately 900 cu. ft. of gas per barrel of oil.

More than 130 wells have been completed to date. Most extensive development has been in the D (3,700-ft.) sand, but much of the recent development also has been in the E (upper 3,800-ft.) and G (4,000-ft.) sands. Most of the gas which has been returned to the various sands has come from the D sand, although a substantial volume now is being obtained from the I (4,165-ft.) sand.

General view of Continental Oil Co.'s pressure-maintenance plant in Rincon field, Starr County, Texas

Rincon is slightly elongated, anticlinal structure, embracing an area from 4 to 4½ miles long and from 3 to 3½ miles wide, being one of the largest known producing structures in the South Texas district. There is an indicated gas cap area over the top of from 600 to 800 acres in which all sands carry only gas and distillate. This varies greatly in the different sands with some sands carrying gas and distillate far down the flanks. Total producing area now covers upwards of 3,000 acres, extending around the north, west and southwest flanks of the structure. Greatest development has been on the north side.

Although overlapping to a large extent, productive areas of the individual sands do not coincide in all cases. Sands also are not uniform or consistent throughout their respective productive

Completion of adjacent wells in the same sand has been avoided when possible. Consequently, although the surface-spacing pattern until now has been one well to 20 acres, the subsurface spacing in respect to individual sands in most instances is not denser than one well to 40 acres. In several sands, the spacing is much wider, and in at least one sand there is not more than one well to 160 acres. By coincidence, there are only a few instances in which there has been any occasion to complete adjacent wells in the same sand.

The pressure-maintenance plant contains two 600-hp. Clark gas-engine compressors. Each has four compression cylinders, operating in three-stage compression. The first two cylinders of each compressor, operating in parallel, constitute the first stage of compression; the third cylinder of each unit, the second stage; and the fourth cylinder of each unit, the third and final stage.

Vent gas from the field separators is received at the plant from the field gas-gathering system at a pressure of 35 lb. In the first stage of compression, the pressure is boosted to 150 lb. This pressure, in turn, is increased to 450 lb. in the second compression stage, and then to approximately 1,700 lb. in the final compression stage for discharge of the gas to the input system.

Input wells, one for each sand, are located in the gas-cap area just above the gas-oil contact of their respective sands. Gas to each is taken from a common, main return line from the compressor plant in which maximum pressure is maintained. A pressure-reduction valve and meter installation at each input well controls the pressure and volume, respectively, of the gas to the individual wells as desired.

So far there has not been sufficient gas production in the field to justify the installation of gasoline-plant facilities. The present plant, however, has been laid out with a view toward the inclusion of such equipment when desired as well as for the expansion of the pressure-maintenance phase of operations by installation of additional compressors. Also, as previously stated, it is proposed to provide a gas-cycling and distillate-recovery plant for the production of the distillate sands, which at present are not being produced.

Distillate Recovered in Scrubbers

In the meantime, a system of scrubbers serves for the extraction of any fluid content or condensate from the gas. Although the primary purpose of the scrubbers is for the protection of the engines and compressors, an appreciable recovery of distillate is obtained. The installation includes a scrubber on the 35-lb. inlet gas line, another on the 150-lb. compressor discharge system, and a third on the 450-lb. compressor discharge.

The various cooling operations of the plant are performed by a radiator-type cooling system. One radiator is provided for the auxiliary engine, while four radiator coolers and a radiator-type gas cooler are provided for the compressor unit. The last named is for interstage gas cooling at 150 and 450 lb. pressure. The four radiator coolers reduce the temperature of the compressor and engine-jacket water and also take care of the oil cooling through small auxiliary radiator sections located in two of the units.

The radiators on jacket-water service were designed to cool water from 140° F. to 130° F. with 100 per cent air available, and at the same time cool the engine lubricating oil from 140° F. to 120° F.

Electric power is generated by a 142-kw., three-phase, 60-cycle generator unit, driven by a six-cylinder, 9 by 10½-in. vertical gas engine.

The Rincon field was opened in February 1938 by Transwestern Oil Co. and D. D. Oil Co. The first well, drilled near the apex of the structure, was a gas-distillate producer, and it was not until September 1939 after W. R. Davis, Inc., had taken over the block that the first oil well was completed. In the interim, no development had been undertaken. The latter company carried on development until the early part of 1941, when Continental Oil Co. acquired the properties. The pressure-maintenance operations were instituted by Continental Oil Co., a pioneer in high-pressure-gas-return operations in connection with flush production.

Pressure-maintenance operations have been facilitated by the fact that the leases are in large ownerships, consisting solely of state school lands and properties held by the T. B. Slick estate.

Formations in the Rincon pool make it one of the most strategic for the use of dual completions. The use of this type of completion, now in use in other states, would cut steel requirements, now so much needed, by approximately 50 per cent.

GLOSSARY of terms used in PETROLEUM CHEMISTRY

Contact

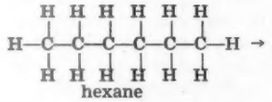
In its broad application the word means to bring together, but when used in connection with catalytic chemistry the term also implies bringing together the reactive materials in the presence of a catalyst.

Cracked

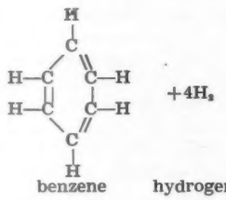
Heavy, complex hydrocarbon molecules can be broken down physically and chemically into lighter molecules just as a heavy fuel oil can be broken down into methane gas, gasoline, residual fuel oil and coke. Heat and time augmented by catalysts and pressure determine the extent of cracking and the nature of the products.

Cyclization

Hydrocarbons which have a structural formula depicting the carbon atoms arranged in a straight, open chain may be caused to change this structure to one of a closed ring. The procedure is known as "cyclization." A theoretical example explaining the term follows:



hexane



benzene hydrogen

Demulsify

To break down an emulsion. In order to do this it is necessary to remove or segregate one of the phases making up an emulsion. Every emulsion consists of droplets of one liquid suspended throughout another. Usually a third component is involved in a true emulsion, which component is a solid that is immiscible in both liquids and separates them by covering the surface of each droplet of one dispersed throughout the other. Ordinary gravy is an emulsion of this type. The droplet of grease is coated with a film of flour which is suspended or dispersed in water.

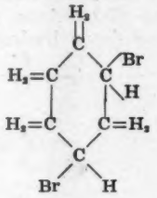
Dewaxing

This implies the removal of paraffin wax. This is necessary when producing lubricating oils to avoid their congealing in cold weather. Waxes also serve as poor lubricants, although the crudes containing the highest percentages of wax also yield lubricants of the highest lubricating value. Paraffinic-base oils are recognized as having a naturally high viscosity index, for example. The removal of wax from the oil may be accomplished by crystallizing the wax in the oil by slow cooling, followed by chilling and collecting it on porous blankets through which the oil passes. Selective chemical oil and wax solvents are often employed to assist in the separation of the wax from the oil.

Dibromocyclohexane

This word was chosen for discussion because of its simple complexity. The length of the word would normally cause it to be avoided in vocabularies, but when the combination of parts is analyzed it not only becomes understandable but its familiarity gives confidence to the reader in visualizing other long chemical names.

The chemical formula for this material follows:



The two bromine atoms (Br) attached to the two carbon atoms account for the *dibromo* portion of the name. There is no simpler way to say that the molecule of a material includes two parts of bromine. The *cyclo* portion indicates that the carbons are arranged in a ring, each carbon atom bonded to two others. Finally, the *hexane* portion of the name suggests that six carbon atoms are attached as a major chemical unit. Therefore the name of this material was chosen to indicate a cyclic arrangement of six carbon atoms to which are attached two bromine atoms to substitute for two hydrogen atoms.

Ester

A product resulting from the replacement of hydrogen in an acid by a hydrocarbon radical. An ester is often considered as the hydrocarbon salt of an acid. The analogy can best be indicated by these two well-known reactions:

$$NaOH + HCl \rightarrow \underset{\text{salt}}{NaCl} + H_2O$$

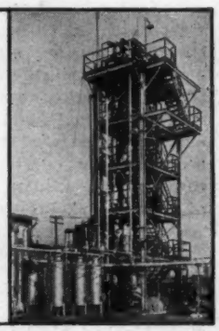
$$\underset{\text{ethyl alcohol}}{C_2H_5OH} + \underset{\text{acetic acid}}{CH_3COOH} \rightarrow \underset{\text{ethyl acetate (ester)}}{CH_3COOC_2H_5} + \underset{\text{water}}{H_2O}$$

Ethyl Alcohol

Most common of the large alcohol family. Produced in large quantities for use as an intermediate in the manufacture of chemicals. Recognized as the stimulant in liquors. Produced in past as result of grain and fruit fermentation, but increasing quantities now being made by catalytically cracking petroleum, sulfonating the olefins so produced and then hydrolizing.

CHEMICALS *from* PETROLEUM

By W. T. ZIEGENHAIN

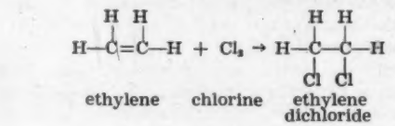


ETHYLENE GLYCOL

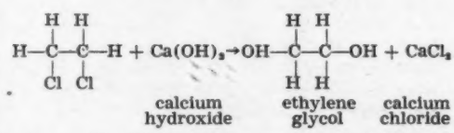
ONE of the most important products of petroleum chemistry to date has been ethylene glycol. This name has been adopted, first to indicate the basic ethyl structure and then to indicate the presence of two OH groups to make the glycol. The material is recognized as a colorless, odorless, sweet-tasting liquid of almost oil consistency which has been used in increasing quantities yearly as an antifreeze and as a solvent or diluent for certain explosives.

Ethylene glycol owes much of its high commercial value to its relatively high boiling point, it being 387° F. Other physical constants of general value to the petroleum chemist include its specific gravity of 1.125 and its vapor pressure of 0.09 mm. Hg at 68° F. Its complete and ready miscibility with water is another one of its favorable characteristics.

It is prepared in several ways but the most important appears to be through the chlorination of ethylene. Natural gases are sometimes used as the base material, the most valuable portion of the natural gas being the ethane. This must be dehydrogenated to make ethylene. Upon chlorination, two atoms of chlorine attach themselves to the molecule, one chlorine joining each of the unsaturated carbon atoms according to these simplified equations:



ethylene chlorine ethylene dichloride



calcium hydroxide ethylene glycol calcium chloride

Above, the reaction is shown for the replacement of the chlorine atoms by OH groups. This serves as an excellent example of the general practice of chlorinating or halogenating the basic hydrocarbon molecule to enable the replacement of the halogen with other groups which will not attach themselves to the original hydrocarbon directly. In the reaction shown above, a relatively weak hydroxide was chosen as is the common practice in industry. The theory advanced for the use of the relatively weak alkaline portion of the reactive agencies is that better control of the extent of the reaction can be maintained. The chlorine atom being considered generally more reactive is described as "more ready" to leave the ethyl group to join the calcium and thereby provide a place for the OH groups to attach themselves.

The *HALOGENATION* of Aliphatic Hydrocarbons (Part 4)

By GUSTAV EGLOFF and M. ALEXANDER
Universal Oil Products Co.

Following this discussion of the use of chlorine, bromine, iodine, and the recognition of fluorine as a halogen in converting petroleum hydrocarbons into finished articles of trade, the series will include discussions of oxidizing and nitrating these hydrocarbons.

6. Halogen Substitution and Addition of Alkynes

Alkynes react with halogen by both substitution and addition. The substitution reactions occur under limited conditions and produce explosive compounds. Halogens, hydrogen halides, and acetyl halides are added to the triple bond. Haloalkenes from hydrogen halides and dihaloalkenes from halogens are isolated as the primary addition products in some reactions while further halogenation occurs in others with formation of only dihaloalkanes and tetrahaloalkanes. Halogen addition may be catalyzed by light, peroxides, metals, or metallic salts. The presence of peroxides has an effect similar to that observed with alkenes. Photohalogenations give evidence of chain reactions following courses similar to those postulated for alkanes and alkenes.

Alkynes substitute halogen atoms upon reaction with alkaline hypohalites. Iodine substitution may also be accomplished by use of iodine in liquid ammonia. Substitution of chlorine or bromine for the hydrogen attached to a triply bonded carbon atom of either ethyne, 1-heptyne, or 1,3-butadiyne occurred in reaction of the corresponding sodium hypohalite with the hydrocarbon.[178] Although iodination resulted from the hypoiodite, the indirect method of using iodine in potassium iodide may be used.[179] An alkaline solution is necessary for substitution since addition occurs in acid solution with ultimate formation of a compound, $RC(=O)CHX_2$.[178] It was postulated that halogen substitution of the positive hydrogen arises from the increased positivity of the halogen from a hypohalite ion present in the more highly ionized alkaline solutions over that of the halogen from an acid hypohalite. The substitution reaction was carried out in an ice bath in the absence of light and air.[179] The compounds formed were 1,2-dihaloethyne from ethyne, 1-halo-1-heptyne from 1-heptyne, and 1,4-dihalo-1, 3-butadiyne from 1,3-butadiyne. These compounds explode on contact with air.[178] Ethyl-, butyl-, pentyl-, and heptyl- derivatives of ethyne substituted iodine in the presence of liquid ammonia. As much as 97 per cent diiodoethyne was obtained from interaction of ethyne and iodine in liquid ammonia.[180]

Addition of halogens to alkynes in the presence of light is similar to the photohalogenation of alkenes. In the alkyne reaction, the simple addition product, a dihaloalkene, may be isolated but tetrahaloalkanes form readily. Photochlorinations and photobrominations have been used to facilitate the study of chain mechanisms of reaction. Reaction of ethyne with chlorine illuminated by a mercury arc lamp began with an induction period which was followed by an appreciable decrease in volume.[180] Oxygen hindered the reaction. Formation of dichloroethene was favored by the presence of a greater proportion of hydrocarbon to chlorine. Photobromination of ethyne showed an increase in reaction rate with an increase in light intensity. The reaction rate decreased slowly with elevation of temperature from 60° to 120°. Increased total pressure increased the rate of reaction.[182] [181] Bromine pressure increase alone caused a rise in the reaction rate but the increase in rate was proportionately smaller than increase in bromine pressure. Excess of bromine caused formation of some tetrahaloalkane.[182]

Peters and Neumann postulated a two-step reaction for the photochlorination of ethyne:[180]

$$HC \equiv CH + Cl_2 \rightarrow ClHC = CHCl$$
$$ClHC = CHCl + Cl_2 \rightarrow Cl_2HC - CHCl_2$$

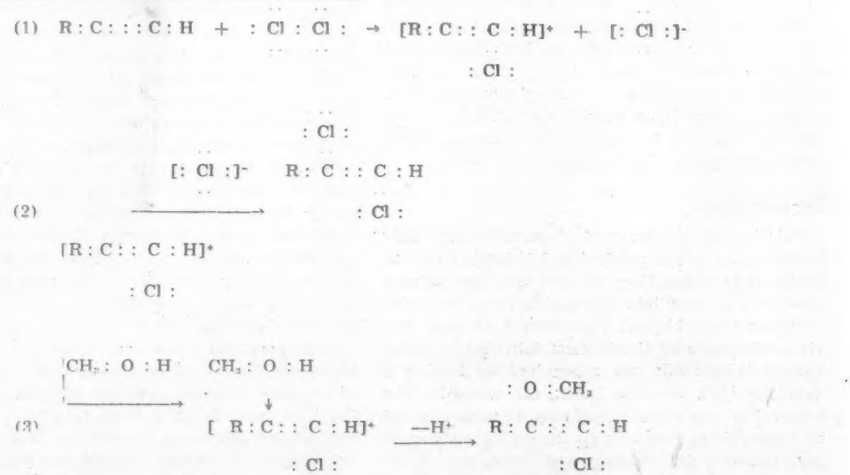
An induction period and inhibition by oxygen were observed and these effects indicate a chain reaction. High quantum yields denote a chain reaction of considerable length in photobromination. Muller and Schumacher found a yield of 4×10^4 mol/$h\nu$ from reaction at 90°, 200 mm. total pressure.[181] Booher and Rollefson[182] obtained reaction chains of 500 in length at 150° and 3,000 at 20°. The actual course of reaction has not been agreed upon. Both postulations, however, include bromine atoms, free radicals, and chain breaking by the disappearance of bromine at the wall. They included a triatomic bromine for which Schumacher and coworkers[181] [183] [182] could find no basis. The proposed courses are

I. (1) $Br_2 + h\nu = 2Br$ [182]
(2) $Br + Br_2 = Br_3$
(3) $Br_3 + C_2H_2 = C_2H_2Br_3$
(4) $C_2H_2Br_3 = C_2H_2Br + Br_2$
(5) $C_2H_2Br + Br_2 = C_2H_2Br_2 + Br$
(6) $C_2H_2Br = C_2H_2 + Br$
(7) $Br_2 + W = 3/2\ Br_2$
(7') $C_2H_2Br_3 + W = C_2H_2 + 3/2\ Br_2$
or $C_2H_2Br_3 + 1/2\ Br_2$

II. (1) $Br_2 + h\nu = Br + Br$ [183]
(2) $Br + C_2H_2 = C_2H_2Br$
(3) $C_2H_2Br = C_2H_2 + Br$
(4) $C_2H_2Br + Br_2 = C_2H_2Br_2 + Br$
(5) $Br \rightarrow Wall = 1/2\ Br_2$

The halogens are added to alkynes in the presence of metals and metallic salts. Reaction of chlorine and ethyne is explosive if not modified in some way and metallic catalysts offer a suitable means. One successful method of modification involved the use of antimony pentachloride in place of chlorine as halogenating agent.[183] The product of this reaction was tetrachloroethane. Reaction of ethyne with antimony pentachloride and some antimony trichloride produced dichloroethane. The reaction using chlorine as halogen containing agent may be modified by catalysts. Aluminum, iron, or an alloy of aluminum, silica, and iron were successfully used in the preparation of tetrachloro-ethane.[184] The deuterium derivative of ethyne was chlorinated to give tetrachloroethane-1, 2-d_2 in the presence of a catalyst and artificial light.[185] Bromoiodoethene was prepared by reaction of ethyne with water, hydrochloric acid, or chloroform and alcohol solutions of bromine and iodine.[186]

Addition of halogens in reactive solvents to 1-hexyne leads to a variety of products. In the presence of methanol, the chlorination reaction yielded 1,1-dichlorohexanone and 1,1-dichloro-2, 2-dimethoxyhexane in addition to 18 per cent 1,2-dichloro-1-hexene.[187] Bromine in methanol, however, formed over 90 per cent 1,2-dibromohexene. The following explanation was offered for addition in reactive solvent:



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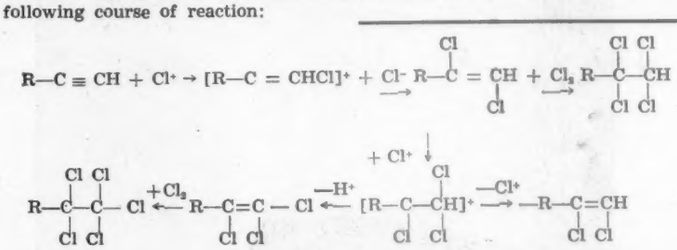
Formulas 1 and 2 represent the normal addition and 1 and 3 represent reaction with the solvent. In 3 the solvent coordinates with the positive fragment to form a complex which stabilizes by rejecting the hydrogen ion.[187] No oxygen compounds were obtained in the chlorination of 1-hexyne when water solutions of 35 per cent hydrogen chloride, 30 per cent sulfuric acid, 30 per cent phosphoric acid, or a methanol solution of 22 per cent hydrogen chloride were used.[188] The high proton effect of the acids seems to eliminate solvent addition. The products of chlorination support the following course of reaction:



In hydrogen bromide addition, the same effect of peroxide catalysis observed in the case of alkenes persists with alkynes. In the presence of peroxides, propyne added hydrogen bromide to form 1,2-dibromopropane while under antioxidant conditions or without added peroxides the product was 2,2-dibromopropane.[189] 1-Hexyne yielded essentially 1-bromo-1-hexene in the presence of peroxides. Only one part of normal product, 2-bromo-1-hexene, to five parts of abnormal product was obtained even in the presence of hydroquinone, but the predominance of abnormal product under antioxidant conditions may have been caused by contamination of the reactants with oxygen.[190] The addition of hydrogen bromide was also found to be much more rapid in the presence of peroxides. A 2-alkyne, 2-butyne, formed the abnormal product, 2,3-dibromobutane, instead of the normal 2,2-dibromobutane when both peroxide and a solvent, acetic acid or pentane, were present.[191] It was believed that the inert solvent probably retards the normal reaction and that the abnormal reaction is a chain reaction which would not be greatly retarded by a solvent.

Metals and metallic salts catalyze the addition of hydrogen halides to alkynes. Addition of hydrogen chloride to ethyne in the gaseous phase seemed to occur only in the presence of metallic chlorides.[192] Reactions catalyzed by mercuric chloride on silica gel gave over 90 per cent yields of chloroethene. Bismuth chloride and ferric chloride on silica gel were much less effective. With zinc chloride on silica gel, poor yields of chloroethene were obtained but 1,1-dichloroethane was found in large quantities. These results would indicate that zinc chloride is a good catalyst for addition of hydrogen chloride to chloroethene. Mercuric chloride on silica gel was much more effective than the crystalline or gaseous mercuric chloride or silica gel alone.[193] Mercuric chloride seemed to be the necessary catalyst but a solid form of catalyst with a surface on which the reacting gases might be absorbed was also essential. Tetrachloroethane was produced in good yield when iron, iron oxides, or antimony pentachloride was used.[194] The order of effectiveness was antimony pentachloride > iron oxide > iron. Cupric chloride in combination with ammonium chloride has also been used as catalyst but the results were comparatively poor.[195]

Mercuric bromide, antimony bromide, or ferric bromide on asbestos, and ferric bromide or bismuth bromide on pumice were used as catalysts in hydrogen bromide addition to ethyne.[196] Ferric bromide on pumice and mercuric or antimony bromide on asbestos were effective. Action of ferric bromide was decidedly greater at 200° than at 100° while mercuric chloride and antimony bromide did not seem to be affected by the temperature. The product was composed for the most part of 1,2-dibromoethane but in some instances appreciable quantities of the 1,1-dibromo compound were obtained. Pumice alone as catalyst at 160° to 170° was not very good.[197] Cupric chloride with ammonium chloride or the corresponding bro-

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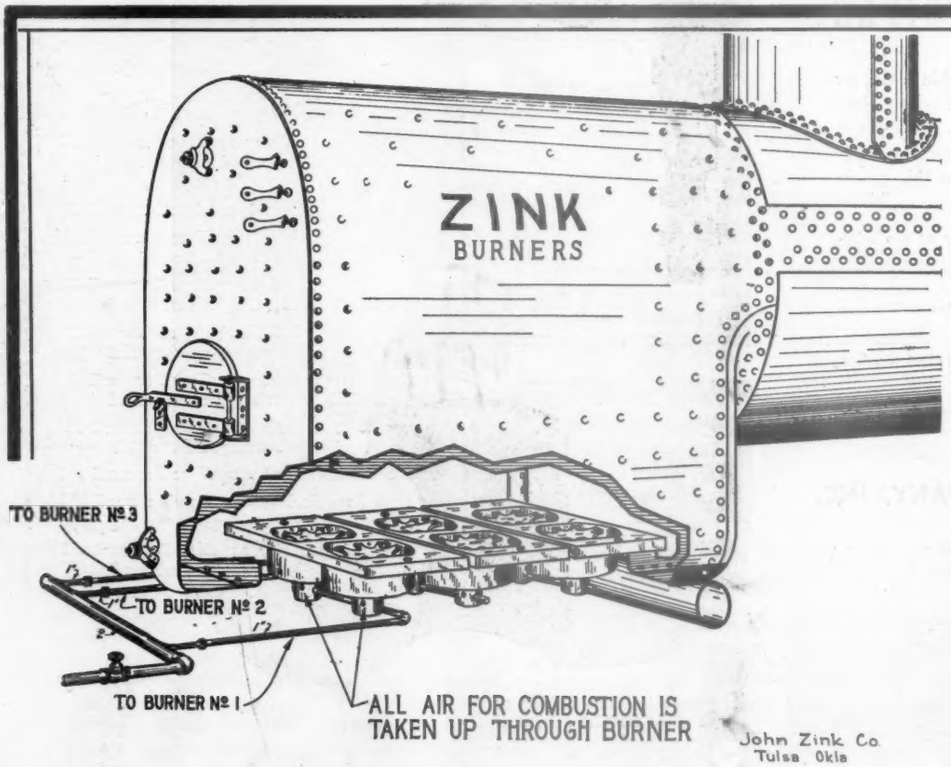

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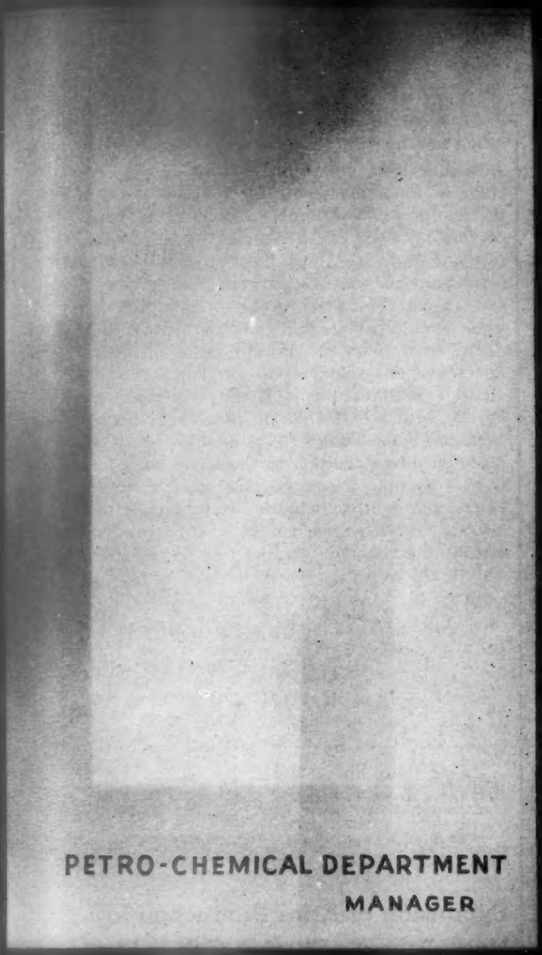

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mides acted as catalysts in hydrogen bromide addition to ethyne.[198]

Metallic salts also catalyze additions of acetyl chloride to alkynes. Stannic chloride catalyzed the addition of 1-pentyne, 1-hexyne, 1-heptyne, 1-octyne, 1-nonyne, 1-decyne, and some alkynes of formula R—C≡C—R.[199] The products obtained from 1-hexyne were 15 per cent 2-chloro-1-hexene and 37 per cent 4-chloro-3-octen-2-one. 1-Pentyne gave no chloroalkene but the other 1-alkynes produced from 20 to 35 per cent yields of chloroalkenes and 25 to 40 per cent ketones. Aluminum chloride used at 15° catalyzed the reaction of ethyne with acetyl chloride to give 25 per cent 1-chloro-1-buten-3-one.[200] The addition may take place by direct addition to the triple bond but it is also possible for acetyl chloride first to form ketene and hydrogen chloride and then add to the alkyne. The latter mechanism would also account for the chloroalkene formed in the presence of stannic chloride.[199]

$$(1)\ CH_3COCl \xrightarrow{SnCl_4} CH_2 = C = O + HCl$$

$$(2a)\ RC \equiv CH + HCl \longrightarrow R - CCl = CH_2$$

$$(2b)\ R - C \equiv CH + CH_2 = C = O \longrightarrow RC \equiv C - CO - CH_3 \xrightarrow{+HCl} R - CCl = CHCOCH_3$$

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Expansion of Arms Production to Have Postwar Effect A.C.S. Told

BUFFALO, N. Y.—Under the pressure of war, chemical developments are proceeding so rapidly that "the world of 1940 has already become an antiquity."

"The inconceivables of only 2 years ago are today's realities," according to Dr. Charles M. A. Stine, a vice president of E. I. du Pont de Nemours & Co., and its advisor on research and development, speaking before the American Chemical Society Tuesday.

Dr. Stine emphasized that the war is compressing into the space of months developments which might have taken half a century to realize if necessity had not forced the pace. The Du Pont chemist enumerated many separate scientific revolutions which are on the way.

Aluminum production by the end of next year, he said, will be seven times greater than it was in 1939 after 50 years of development. It will furnish in 1 year enough metal to build three times the number of passenger cars now operating on all American railroads.

Under war pressures to create better fuels for airplanes so much progress has been made, he declared, that "the petroleum chemist now sees all existing motors as out of date," for fuels can now be made that go beyond the octane scale.

"Since motor-car production stopped," he added, "the shiny new models that are gathering dust in dealers' storerooms have aged, technically, at least 2 decades. We are now in the 1960's of motor cars, as measured by the old pace of development."

There will be sealed cooling systems, now used in aviation; weights may be half what they are. Power will be up and fuels may yield 50 miles to the gallon.

"The newest and most versatile of plastics will be available after this war on a scale beyond all previous conceptions," Dr. Stine asserted. "The high-pressure synthesis of ammonia, one of the major chemical exploits of the century, will have taken on an industrial status that, in terms of new producing capacity, may be comparable to the discovery of a sixth continent. The amount

(Continued on Page 57)

Filtration of Oils By the Use of Prepared Magnesium Silicate

By H. E. BIERCE, SR.
Associated With Westvaco Chlorine Products Corp.

Natural clays, high in adsorptive value and sometimes made more active by chemical treatment, are used in large quantities by refiners for the removal of colored hydrocarbon derivatives from lubricants. The removal of objectionable sulfur compounds is also a justification for filtering oils through earth. Here, however, the use of a manufactured adsorption media is described as applied in a large western Pennsylvania refinery.

IT has been recognized for some time that many raw decolorizing clays derive their activity from an adsorbent magnesium silicate content. Good examples of such clays are fuller's earths of the south and certain desert clays of western Nevada found in territory adjacent to Death Valley. This group as a whole, as distinguished from other adsorbent clays in which aluminum silicate appears to be the active principle, has several well-marked characteristics.

The first is that they are not amenable to acid treatment. They are ordinarily known as "non-treating" clays because their decolorizing power cannot be improved by either of the well-known methods of such treatment. On the other hand, montmorillonite and certain clays of the so-called bentonite or subbentonite type are greatly improved by such treatment and such improvement is ordinarily accompanied by a marked decrease in the magnesium silicate content of the treated product. A third class of clays is one in which the predominating minerals are a combination of aluminum and magnesium silicates, and many such clays are improved by acid treatment only to a limited extent.

A second characteristic of those clays which derive their activity from magnesium silicate is that they are approximately equally effective as decolorants whether used as contact clays in a finely ground condition or as percolation material in a granular form. There is a very marked difference in the other groups.

Still another characteristic is that in contact filtration they do not require such high oil temperatures to obtain satisfactory results, which points to the conclusion that chemically combined water is not a factor in their decolorizing ability, although it is a factor in other types of clays. Such magnesium silicate clays can also be heated to temperatures in excess of 1,000° F. before use without harm and are so heated in the case of percolation grades, while other types are distinctly harmed by such heating.

Generally speaking, clays of the magnesium silicate type vary in activity in proportion to the magnesia content. It was therefore a logical conclusion, particularly in view of the facts mentioned above, to assume that if the proper type of magnesium silicate could be manufactured in a pure condition, such a product would be much more active than natural clays which of course contain impurities and inert matter. Also its manufacture would be under chemical control resulting in a high degree of uniformity at all times. The result of these conclusions is the product known as Magnesol, an active magnesium silicate with characteristics as anticipated.

Prior to the development work which led to its manufacture on a commercial scale, there had been some effort made to produce synthetic magnesium silicate. Such work was based upon the use of magnesium hydroxide or magnesium carbonate, in the form of brucite and magnesite, and free silica. The magnesium mineral and the silica were autoclaved together in a slurry at elevated temperatures and pressures. However, development work proceeded along entirely different lines.

After some preliminary work, it was decided to make a precipitated product using solutions instead of solids to obtain the desired magnesium silicate. This idea, as developed, represented an entirely new field as far as is known.

Upon the completion of the development work in 1936, the company erected a plant at South Charleston, W. Va., for the manufacture of an active magnesium silicate to be produced by this precipitation method. The plant was located there because of abundant supplies at that point of calcium chloride and magnesium chloride, both of which enter into the manufacturing process. These salts and the brine from which they come are produced by Westvaco Chlorine Products Corp., which owns Magnesol Co. This insured a continuous supply of the necessary raw materials for the new plant, and for any reasonable future expansion.

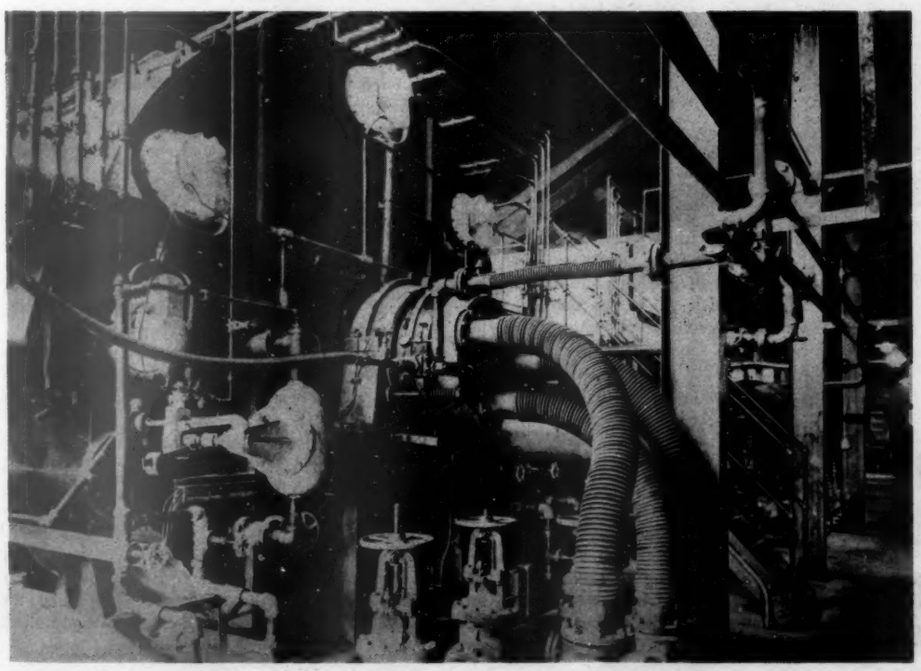
Material Light Weight

From the standpoint of the refiner, the product of the plant has many interesting and advantageous characteristics. It has a very high efficiency in the decolorization of all petroleum products which are subject to filtration. It is relatively more efficient on oils of high viscosity index whether such oils are obtained from paraffin-base crudes or are produced by solvent extraction. It is slightly alkaline, having a pH of 7.3 to 7.5. It imparts an extremely high degree of color stability to the oil with which it is contacted. It is not necessary to use extremely high temperatures in contacting, the required speed of the subsequent filtration being the controlling factor. Perhaps one of its most valuable characteristics is the ease with which it can be reactivated by a simple method of solvent washing.

In using it as a contacting material, no change is necessary in the ordinary plant. Due regard must be given to the fact this filter medium is relatively light, weighing only 22 lb. per cu. ft. This will require some adjustment of the clay-feeding device. Because of this light weight the filters or filter presses will hold less by weight per square foot than of the average contacting clay, but this fact is offset by the fact that much less by weight is ordinarily required.

It was stated above that natural decolorizing clays of the magnesium silicate type are almost equally effective whether they are used as contacting clays or as percolating material in the granular form. This is also true of Magnesol, although at the present time its production is confined to finely ground clay for contacting. Labo-

Battery of filters in use for magnesium-silicate filtration of oils



ratory hand samples show that it serves as an excellent percolation material; also that when it is used to precoat the leaves of a pressure filter and oil then pumped through this precoat, the decolorizing effect is very marked. This has led to the development of a process in which the raw oil is pumped through the spent cake left from the previous contact and filtration; the oil which has thus passed through the spent clay is then mixed with fresh material, contacted as usual, then filtered through a clean filter and thus another spent cake is built up. The cycle is continued.

This method is best used when two or three filters are available, thus enabling the operator to have a continuous stream of oil entering the contact tank which has already been passed through the filter cake, presumably exhausted from the previous contact, and at the same time continuously building up a cake in another filter which in turn will be used for more raw oil. It has been found that this procedure is particularly advantageous in cases where residual oils produced from Pennsylvania crude can be brought to the filters while still holding their residual heat, thus making it unnecessary to reheat them; and also in the case of overhead oils which have been acid-treated and are still on the acid side. When this method is applied to such acid oils the filtration through the used cake reduces the acid number generally to about one-fourth of that of the original acid oil and allows the following contact with fresh material to bring the acid number to specifications together with the color, in a balanced condition. Wherever it is applicable it is found that this dual filtration does not result in a decreased net throughput but, rather, such throughput is actually increased because less fresh filter medium is required and thus the filter cycle is increased in length, resulting in a longer pumping period and less net time consumed in blowing and cleaning the filter.

Relative Costs

The successful reactivation of this filter medium on a commercial scale is an accomplished fact. A large Pennsylvania refinery has used this method exclusively in the filtration of all of its oils for the past 3 years, and has obtained filtration costs which are much lower than those of any other method in a similar operation. Such reactivation is a major development in contact filtration and in petroleum refining methods.

In any comparison of costs between contacting and percolation it has always been necessary heretofore to compute them on the basis of one use for the contact clay while percolation has benefited from comparatively inexpensive regeneration and subsequent reuse of the clay. The reactivation of contact clays by burning is not a desirable operation because of excessive losses and the low degree of reactivation obtained.

Because of the undesirability of attempted reactivation of fine clay by burning, contacting has suffered in comparison with a method which has been able to use its decolorizing material many times and in which the cost of regeneration is much less than the cost of the original material.

It cannot be denied that contacting has been limited to certain plants or fields in which special conditions existed nor can it be denied that contacting has properly replaced percolation where those conditions prevail. It has been recognized that if a very efficient contacting material became available which at the same time could be reactivated by an inexpensive method and to a high degree of activity, contact filtration would then be on an entirely different footing and able to successfully compete under practically all conditions.

In any appraisal of the two methods of filtration the oil which is retained in the clay from the contacting operation comes up for consideration. In contacting, this retained oil is generally lost and discarded with the clay, because there is always a question whether its recovery by naphtha is profitable, involving as it does some method of washing the filter cake and the recycling of the oil-naphtha solution. In percolation this retained oil is recovered as a necessary part of the reactivation of the clay and its value constitutes a considerable credit against the reactivation costs.

In the reactivation of this material at the Pennsylvania refinery referred to above, the first step in the process consists of washing the spent clay, obtained from Sweetland pressure filters, free of its retained oil. This is accomplished by conducting such spent filter cake to repulping tanks which are provided with a stirring device. The clay with its retained oil is mixed with naphtha in these tanks.

Naphtha Required

The amount of naphtha required varies from one to two times as much by volume as the amount of the oil which is contained in the spent cake. When this repulping action is completed and the mixture has become a smooth slurry, consisting of naphtha, oil, and filter medium, the content of each such repulping tank becomes a feed for a primary deoiling filter by means of which the oil-naphtha mix is separated from the filter medium. The filter used is a Goslin-Birmingham rotary vacuum filter with a tight cover over the drum and the inside space protected by a cover of flue gas. This filter is operated in series with another filter of exactly the same type, size, and cover.

The clay discharge of the first vacuum filter in the form of a heavy naphtha slurry, is pumped to the second filter. Both filters are washed with naphtha and many variations of this washing procedure have been tried to obtain the best results. Probably the best results are obtained by washing the second filter with fresh plant naphtha for the removal of the small amount of oil which remains in its cake, then using the filtrate from this second filter for the wash of the first filter. This is an adaptation of the countercurrent idea of washing used so often in metallurgical plants. Thus the filtrate of the first filter contains substantially all of the recovered oil, and the clay discharge of the second filter has been washed substantially free of oil by fresh naphtha.

The filtrate of the first filter is returned to the contact plant for recycle, having first become mixed with the reactivated clay from the next step as will be explained later. This method, while subject to many variations, appears to be a simple and very effective method of recovering the retained oil. It is understood that the clay discharge of the second filter holds up less than one-half of 1 per cent of the oil contained in the original Sweetland filter cake. The above constitutes the complete deoiling operation and the clay discharge of the second filter is now ready for reactivation.

The reactivation of the spent filter medium is accomplished by dissolving the color bodies adsorbed by the clay in a solvent and then washing this solvent and the dissolved color bodies from the clay. The clay discharge of the second deoiling filter is run to a disintegrating or repulping tank in which it continuously meets the proper amount of the color solvent. In this operation the clay is thus thoroughly mixed with the color solvent and the color bodies are dissolved in it. The next step is to wash the clay free of these impurities and this is accomplished on a third rotary vacuum filter of exactly the same type, size and flue gas cover as the two preceding deoiling filters. As the clay cake of this filter emerges from submergence in the filter pan it is washed by sprays of fresh naphtha for the removal of the color solvent and its dissolved color bodies.

The filtrate from this filter, containing substantially all of the color solvent, dissolved coloring matter, and most of the wash naphtha is sent to storage tanks and becomes the feed to a recovery still for the recovery of the color solvent and the naphtha. The bottoms from this operation, containing the coloring matter which has been removed from the contacted oil is used as fuel. The clay discharge of this third, or reactivating, vacuum filter is the reactivated Magnesol. It is washed from the discharge trough of the filter by the filtrate of the first deoiling filter as noted above.

This slurry, consisting of recovered oil, naphtha and reactivated filter medium, is then pumped to storage at the contact plant where the clay is kept in suspension to provide a uniform condition. The oil to be contacted is held in individual tanks containing a specified amount of oil and the proper amount of this slurry, which contains the reactivated filter medium and oil of the same specifications as that which is being contacted, is pumped into this oil charge. This entire charge is then pumped through a tube heater to a temperature of 410° or slightly over and is discharged to a unit consisting of one atmospheric tower and one vacuum tower.

Colored Portion

Any color solvent which may have escaped proper elimination on the reactivating filter is recovered at the head of the atmospheric tower in the form of a concentrate with naphtha, and is added to the filtrate of the reactivating filter for final recovery of the color solvent. Naphtha is also recovered from the vacuum tower and the oil and filter medium are drawn off as bottoms from the vacuum tower to surge tanks. This slurry then becomes the feed to the Sweetland filters for the separation of the oil and clay. At this point the cycle is completed and then discharged Sweetland filter cake again enters the deoiling and reactivation steps. The oil filtrate from the Sweetland filters is finished oil of correct specifications as to flash and color.

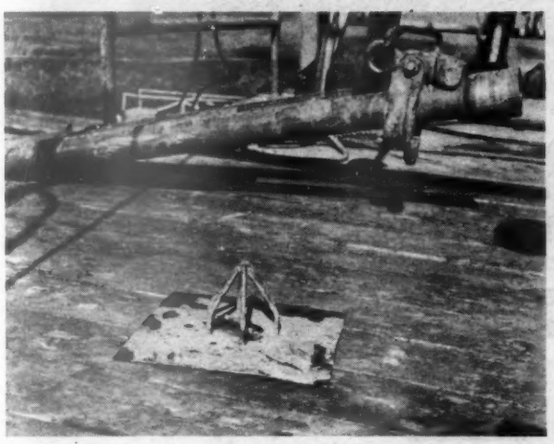
The number of recycles of any given batch contained in this system ranges from 10 to as high as 30, depending upon the type of oil which has been contacted and the efficiency of the reactivating operation. In most cases it is theoretically possible to reactivate the filter medium indefinitely. Practically, there is a slight loss of activity on each recycle and the limit of reuse will depend upon the degree of activity desired. At the plant mentioned above an average of 10 cycles is obtained, at the end of which the reactivated material is still approximately 70 per cent efficient. It is likely that further experience will result in improvement of this figure.

In regard to the capital expense necessary to put the process into effect, such expense will be dependent on several factors. These include the type of plant best suited for the conditions involved, the size of the operation, and whether the reactivated Magnesol is to be returned in a wet or dry form. Again, in the case of the Pennsylvania plant referred to, it was found that the capital expense was highly justified as the resulting operating cost per gallon of oil filtered is 50 per cent or less of their previous cost for the same oils in the same quantity filtered by their former method. This saving returned the installation cost to them in a comparatively short time.

Operating Ideas

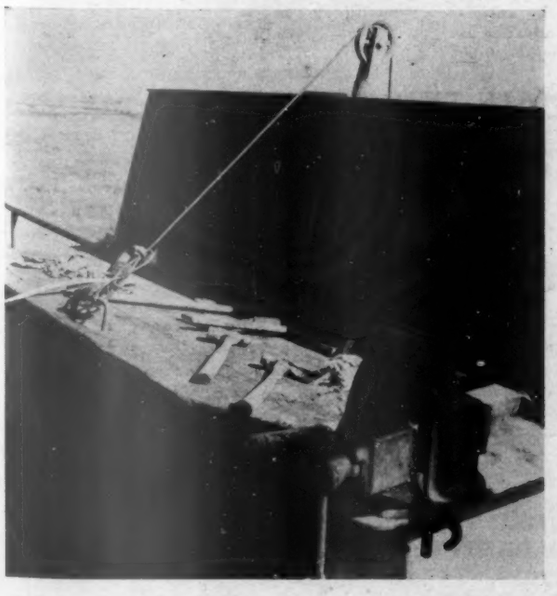
Safety Guard for Mousehole

Many drilling rigs are equipped with auxiliary rathole, or mousehole, for making connections. This method saves considerable time as the kelly does not have to be placed in the rathole but is simply screwed on the joint in the mousehole which is then screwed on the string of pipe already in the hole. The mousehole must be provided with some covering because it does not project above the derrick floor as does the rathole. The accompanying picture shows one type of mousehole guard made from tank steel and old sucker rods.



Counterbalanced Work-Bench Shelf

Lifting the lid of a tool box required considerable exertion so this drilling crew rigged up a counterbalance as shown in the accompanying photograph. The wooden shelf and top to the chest is hinged at the back and a line attached to the handle at the front runs over the pulley and supports the counterbalance. The tool rack at the back is made of steel and it serves as a cover for the tool box while moving. It also is hinged.



Walkway Is Inverted Boat

A place to carry pipe, connections, and tools while moving is provided by this unusual walkway used on a rig operating in the Slaughter, Texas, field. The walkway is made of heavy oak planking bolted to a frame constructed from drill pipe. The 50-ft. walk is made in two sections, bolted together. When time comes to move, the sections are parted and rolled over, in which position they become boats or racks.

Holes Prevent Corrosion of Tank Support

In many fields it is necessary to place tankage and other production equipment above the high-water level. The photo shows one such installation made from old pipe and channel irons. One of the problems encountered with such structures is the corrosion of the tubular-steel supports. The outside can be painted whenever necessary but the water or moisture on the inside creates an ideal condition for corrosion. By drilling numerous small holes in the pipes a means is provided for the water to escape from the inside. The holes also provide ventilation so any remaining moisture can be evaporated.

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QUESTIONS ON TECHNOLOGY

Replacing Butylenes With Pentylenes for Alkylates

By W. L. NELSON, Technical Editor

As cracking-plant operators we have been wondering why pentylenes could not be substituted for butylenes in the manufacture of the alkylates needed so much for 100-octane gasoline. What is wrong with the use of pentylenes for this purpose?—J. A. B.

A direct answer to this question is difficult because of a lack of chemical information on the alkylation reactions of the pentenes, etc., and because of a lack of knowledge of the composition of the mixed pentene fraction produced in cracking plants.

The fact that large quantities of pentylenes (pentenes) are available for this purpose in cracked gasoline is certainly an advantage. It would seem that the percentage of pentanes and pentenes in cracked gasoline might exceed 10 per cent, of which perhaps one-fourth or more might be isopentylenes. On the basis of past productions of cracked gasoline there may be something like 25,000 bbl. per day of isopentenes available or perhaps 50,000 bbl. per day of mixed pentenes. Using the lower figure, this would represent about 35,000 bbl. per day of finished alkylate or would be sufficient for the production of over 80,000 bbl. per day of additional 100-octane gasoline, over and above what can be produced by the use of isobutene (isobutylene). Such an alkylate could be about equal in octane number to the alkylate now being produced from isobutene, but it would have a somewhat higher boiling range. The high boiling range would not be altogether a disadvantage because it would permit the use of larger amounts of isopentane in the final blend of 100-octane gasoline; and isopentane is probably the one constituent of a 100-octane fuel that is available in overabundance and can be obtained with most ease or with a minimum amount of new equipment. It might also be mentioned that the pentanes (and pentenes) can be produced in relatively low-pressure equipment (a little over atmospheric pressure) as compared with that required for the butanes.

A disadvantage which appears is the closeness of the boiling points of the pentanes and pentenes as compared with the butanes and butenes. A general disadvantage is the fact that we are not as familiar with the behavior of the pentenes as with the behavior of the butenes. We do know that new operating conditions must be developed for the extraction of pentenes from pentanes, and for the alkylation of pentenes. Doubtless other now-unforseen difficulties will also arise.

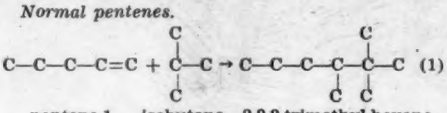
The utilization of pentylenes by alkylation is substantially confined to reactions which involve isobutane and the isopentenes. This is necessary in order to obtain a high-octane product, i.e., one composed of highly branched paraffinic hydrocarbons. The exact reactions that will occur and the extent to which each reaction will occur cannot be definitely stated at this stage of our knowledge but if all possible reactions are given equal weight, the octane numbers of the alkylates that will be produced are somewhat as follows:

Charge stock—	Approx. O.N. of alkylate (M.M.)
Mixed pentenes and propane	45.4
Isopentenes and propane	58.7
Mixed pentenes and isobutane	80.0
Isopentenes and isobutane	90.7

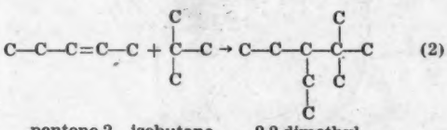
These average values of octane number are not of much value in themselves but they are useful as a means of comparing the types of stocks that must be employed. Obviously propane is not satisfactory and it will be necessary to work primarily with the isopentenes although a small amount of the normal pentenes may be permitted in the charge stock as will be shown below.

A more careful consideration of the chemistry of such reactions indicates that the following reactions should predominate above all others (hydrogen atoms are omitted:

Normal pentenes.



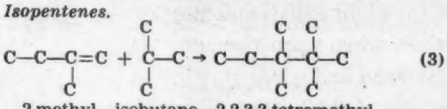
(1) pentene-1 + isobutane → 2,2,3-trimethyl hexane (O.N. of 90)



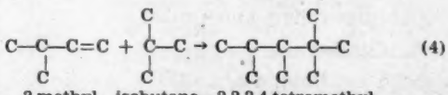
(2) pentene-2 + isobutane → 2,2-dimethyl 3-ethyl pentane (O.N. about 54)

or about equally Reaction 1 shown just above.

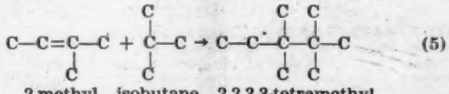
Isopentenes.



(3) 2 methyl butene-1 + isobutane → 2,2,3,3-tetramethyl pentane (O.N. of 125)



(4) 3 methyl butene-1 + isobutane → 2,2,3,4-tetramethyl pentane (O.N. about 124)



(5) 2 methyl butene-2 + isobutane → 2,2,3,3-tetramethyl pentane (O.N. of 125)

Considering these most probable equations it appears that the octane number of the alkylates will be greatly higher than those indicated above, or about as follows:

Mixed pentenes and isobutane yields on alkylate of about 107 octane number.

Isopentenes and isobutane yields on alkylate of about 124 octane number.

In actual practice a number of other reactions will take place and hence it is not practical to expect an octane number much higher than 100 by such a process. It should be recalled that a large number of alkylation reactions are possible—about 10 between pentenes and propane, and about 20 between pentenes and isobutane—and that a large number of isomers are possible. The selection of the above equations was based primarily upon chemical considerations and their feasibility has not been checked by thermodynamic studies.

The alkylation of isopentanes with isobutene or propene has not been considered inasmuch as our stocks of isobutene are already being utilized in programs now under way.

The difficulty is separating the isopentenes by fractionation is clearly indicated by the following tabulation of boiling points in which only the pentenes are numbered:

	B.P. (°C.)	O.N. (M.M.)
2,2, dimethyl propane	9.45	83
1. 3 methyl *butene*	18.8	..
2 methyl butane	27.9	90
2. *pentene*-1	30.1	..
3. 2 methyl *butene*	31.05	..
pentane	36.0	64
4. *pentene*-2	36.4	..
5. 2 methyl *butene*-2	38.5	..
3,3 dimethyl *butene*-1	41.23	..
2,2 dimethyl butane	49.73	95

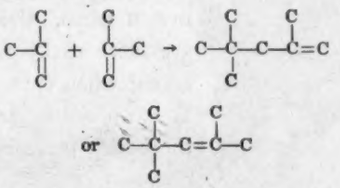
Thus normal and isopentane will be included in any pentene cut that is made by even perfect fractionation, and it appears probable that some chemical or solvent extraction method of separating the pentenes will be required.

Diisobutylene for Butyl Rubber

We see news items in The Oil and Gas Journal about diisobutylene. What is this material and how is it used for butyl rubber? We thought that butyl rubber was made from isobutylene.—D. C. F.

You are correct in thinking that butyl rubber is made primarily of isobutylene and butadiene. The reason for the present program of making diisobutylene at cracking plants is that this material (also called 2,2,4 trimethylpentene-1) is a low-vapor-pressure liquid which can be shipped in barrels, whereas isobutylene is a gaseous material which necessitates the use of pressure cylinders or vessels. The diisobutylene can be decomposed at central butyl rubber plants into isobutylene.

Diisobutylene is produced by sulfuric acid polymerization as follows:



This material can be hydrogenated to isooctane (2,2,4 trimethylpentane) as in the original isooctane processes (1936-37) and would be an excellent so-called alkylate for 100-octane-gasoline manufacture, but due to its purity it is being reserved under Standard of New Jersey program for the manufacture of butyl rubber. Most cracked gases contain about 13 per cent of isobutylene.

The diisobutylene is essentially the same material as the codimer being made for 100-octane gasoline manufactured at cracking plants which have phosphoric acid polymerization equipment. The codimer, however, is a somewhat impure material which is obtained by the polymerization of some butene, propene, ethylene, etc., as well as isobutene. Thus, if such a material were decomposed it would produce the aforementioned materials as well as isobutene.

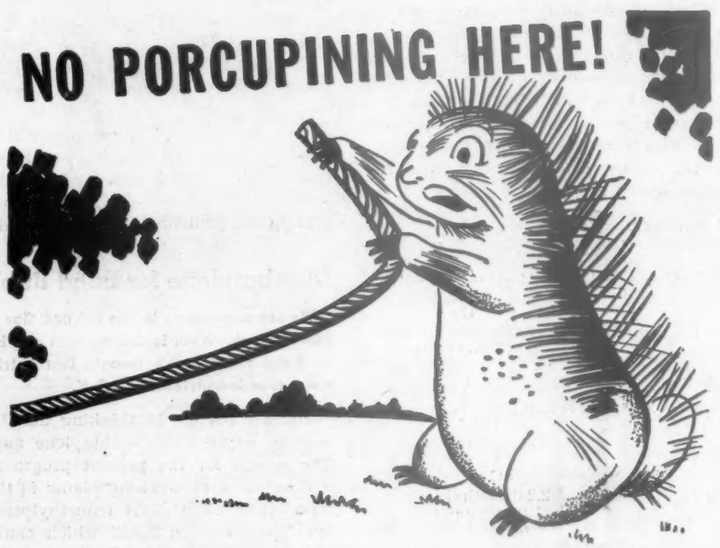
Abstracts of A.C.S. Papers

Presented before Division of Petroleum Chemistry at the annual meeting of American Chemical Society held in Buffalo, N. Y., September 7-11, 1942

Ketones by Condensation of Acid Anhydrides With Olefins

A. C. BYRNS and T. F. DOUMANI (Union Oil Co. of California)

A SYNTHESIS of unsaturated methyl ketones by reaction of branched-chain olefins with acetic anhydride is given. Zinc chloride and sulfuric acid have been found to be effective condensing agents; optimum yields of ketones are obtained with less than 1 mole of condensing agent per mole of reactants. The methyl octenyl ketone obtained as the principal product from diisobutylene has been shown by ozonolysis to be 4,6,6-trimethyl heptene-3-one-2. Polymer gasoline, obtained from cracking-plant gases by polymerization with solid phosphoric acid, has been shown to be a suitable source of olefins. Pilot plant experiments are reported.



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Reduction of Ash Content of Residual Oils With Boric Acid

E. T. SCAFE, E. F. HAYDEN, and V. A. KALICHEVSKY (Socony-Vacuum Oil Co., Inc.)

A PRACTICAL method for "deashing" residual oils resulting from distillation of crudes in the presence of sodium hydroxide has been developed. The oils are treated with boric acid at about 400° F. and the acid is recovered from the resulting sludge by acidification with sulfuric acid or sulfuric acid sludge. The treated oils are free of moisture and easily pass general specifications developed for industrial fuels.

Phase Equilibria at High Temperatures

ROBERT R. WHITE and G. G. BROWN (University of Michigan)

EXPERIMENTAL liquid-vapor phase equilibrium data have been obtained for petroleum fractions boiling from 95° to 750° F. at temperatures from 300° to 820° F. and at pressures from 50 to 700 lb. per sq. in. The results have been used to extend the estimated ideal equilibrium vaporization constants to hydrocarbons having boiling points up to 925° F., at temperatures from 0° to 1,000° F., and at pressures from 1 atm. to 1,000 lb. per sq. in., and to develop a relationship for estimating the values of the vaporization constants in the critical and retrograde regions of complex hydrocarbon mixtures.

Liquid Capacity of Bubble-Cap Plates

A. J. GOOD, W. C. ROUSSEAU, and M. H. HUTCHINSON (E. B. Badger & Sons Co., Boston, Mass.)

IN large-diameter bubble-cap towers, or even moderate-size towers carrying high liquid loads, the hydraulic gradient set up between upstream and downstream ends of a plate becomes an important factor in determining the maximum liquid load the plate can handle and maintain uniform distribution of vapor over the plate. This gradient has been measured under varying conditions on an experimental plate, and data for one type of bubble cap are given as a function of liquid rate, vapor rate, liquid depth above slots, and certain structural characteristics. Charts can be constructed to enable quick checking of allowable liquid rates.

Catalysis of Lubricating-Oil Oxidation

R. G. LARSEN and F. A. ARMFIELD (Shell Development Co., Emeryville, Calif.)

THE catalytic effect of iron, copper, and lead in the bulk and dissolved form on three oils broadly representative of those obtainable from Pennsylvania, Mid-Continent, and California crudes has been studied in detail. The variations in catalytic susceptibilities of the oils, as well as the variations of catalytic activities of the metals

with concentration, are so great that it is concluded that no specified catalyst can be used in laboratory oxidation tests unless correspondence with engines is first well established.

In addition, the catalytic effect of engines on oils was investigated. It was found that the oil-insolubles (called crankcase catalysts) which accumulate in engine lubricants are extremely active catalysts. This catalytic activity resides in the metallic constituents, particularly the halides of iron.

●

Lubrication-Oil Detergency

S. K. TALLEY and R. G. LARSEN (Shell Development Co., Emeryville, Calif.)

FOUR methods of evaluating the detergency of lubricating oils are described. One method involves a chromatographic procedure using lamp black, while the other three make use of centrifugal separation, filtration through an asbestos mat, and infrared transmission, respectively, to evaluate the degree of dispersion of oil-oxidation products. All show useful correlation, within limits, with engine experience on detergency and, in addition, are useful tools in examining the detergent aspects of lubricating oils.

●

Relation of Refractive Index, Density, and Molecular Weight for All Saturated Hydrocarbons

M. R. LIPKIN and C. C. MARTIN (Sun Oil Co. Experimental Division, Norwood, Pa.)

An equation is presented,

$$n = \frac{69.878d - 0.4044ad - 0.797a + 136.566}{5.543d - 0.746a + 126.683}$$

Where
n = refractive index at 20° C. for D line of Na,
d = density at 20° C.
$a = 10^5 \times$ temperature coefficient of density at 20° C., from which it is possible to calculate refractive index (n_D^{20}) within ±0.001 for all saturated compounds or mixtures of such compounds such as hydrogenated petroleum fractions. The temperature coefficient of density has been shown by Lipkin and Kurtz to be related to molecular weight. It has been possible to calculate the refractive index from density and molecular weight almost within the limits of experimental accuracy. This method of calculating refractive index is more accurate than calculations based on the relationships of Sellmeier-Drude, Eykman, Lorentz-Lorenz, Gladstone and Dale, and is not dependent on a knowledge of structure of the naphthene or paraffin as are the existing equations. The application and significance of this equation will be discussed in subsequent work.

●

The Density and Transition Points of the Straight-Chain Paraffin Hydrocarbons

WILLIAM F. SEYER, RALPH F. PATTERSON, and JOHN L. KEAYS (University of British Columbia, Vancouver, Canada)

IN a previous communication to the Petroleum Division the density and transition points of diethyl, $C_{22}H_{46}$, were presented. The same investigation has been extended to the even-numbered paraffin hydrocarbons beginning at $C_{20}H_{24}$ and up to $C_{34}H_{70}$. The odd-numbered hydrocarbon $C_{29}H_{60}$ has also been studied. The same technique as described in the Journal of the American Chemical Society, 61, 1114 (1939) was used. Most of the hydrocarbons were crystallized 20 times Melting points could not be given by any single equation. Three equations are necessary of the type $\log n\text{-}2 = a + bt$, from 7-16, 16-33, 33-44 carbon atoms.

$C_{18}H_{34}$ shows no transition points. $C_{21}H_{44}$ to $C_{30}H_{62}$, $C_{32}H_{66}$ show two transition temperatures on cooling but no definite ones on heating. $C_{31}H_{64}$ and $C_{33}H_{68}$ show no transition points on cooling and on heating, but the points on heating depend upon rates of temperature increase.

$C_{20}H_{42}$, $C_{29}H_{62}$, $C_{32}H_{66}$, $C_{34}H_{70}$, and $C_{29}H_{58}$ all show transition points upon cooling as on heating.

Surface Tensions of Methane-Propane Mixtures

CHARLES F. WEINAUG and DONALD L. KATZ (University of Michigan)

THE surface tensions of the liquids in equilibrium with vapor have been determined for the methane-propane system over the range of 5° to 194° F. and 40 to 1,500 lb. per sq. in. The capillary rise and drop volume methods were used in a glass-windowed equilibrium cell. Differences in results between these methods were explained by the high rates of drop formation in the drop volume method.

A formula was developed which reproduces the

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methane-propane data within 0.1 dyne per cm. This formula may be applied to any mixture when the molecular weight, density, and composition of each phase are known. The research indicated that liquids in the entire critical region have very low surface tensions.

•

The Solubility of Hydrogen In n-Butane

E. E. NELSON and W. S. BONNELL (Gulf Research & Development Co., Pittsburgh, Pa.)

THE solubility of hydrogen in *n*-butane was determined at temperatures of 23.9°, 82.2°, and 115.6° C., and at pressures up to 100 atm. At pressures below 30 atm. solubility decreases with increase in temperature; from 30 to 40 atm. temperature has very little effect on solubility; and above 40 atm. solubility increases with increase in temperature over the temperature range investigated. At concentrations of hydrogen above 3 mole per cent, the shapes of the P-T bubble-point curves derived from the solubility data suggest the existence of a region of isobaric retrograde condensation at temperatures far below the critical region of the mixtures. Data reported by Kay for the system hydrogen-naphtha show a similar phase behavior, and it is believed that the measurements on hydrogen-*n*-butane constitute additional evidence in support of Kay's suggestion that this may be a characteristic property of a general class of mixtures consisting of a liquid and a slightly soluble gas.

•

The Ultraviolet Absorption Spectra of a Series of Dienes

EMMA P. CARR and LUCY W. PICKETT (Mount Holyoke College, South Hadley, Mass.)

THE ultraviolet absorption spectra of 11 aliphatic and three cyclic dienes have been examined. These include 10 hydrocarbons, in which the double bonds are conjugated, two where they are adjacent, and two with isolated double bonds. The characteristic spectra of each type of compound is discussed. The aliphatic dienes show their most characteristic absorption below 2,300° A. and microphotometer records of the spectra of eight conjugated dienes in this region are given and discussed in relation to the spectrum of butadiene. These hydrocarbons include two pentadienes, three hexadienes, and two dienes containing seven and eight carbon atoms. A brief theoretical interpretation of these spectra is given.

•

Photoelectric Color. II. A Study of Light-Colored Petroleum Products

J. C. DEAN, R. J. DeGRAY, and J. W. WILSON, JR. (Socony-Vacuum Oil Co., Inc.)

THE applicability of photoelectric color for the evaluation of light-colored petroleum products has been demonstrated. Readings are taken with a violet filter and converted to photoelectric color or apparent brilliance by a suitable equation. I.C.I. data may be calculated from photoelectric color readings if desired, although this is usually unnecessary in petroleum technology.

The Saybolt chromometer has been shown to be unreliable, and to be greatly affected by the surface tension, refractive index, and specific dispersion of the oil being tested. Photoelectric color may be converted to Saybolt color by the establishment of suitable curves for the types of product in question. The colorimeter used is easily standardized and the results obtained are independent of the particular instrument.

Liquid-Vapor Equilibrium Composition in the HCl-n-Butane System

J. H. OTTENWELLER, CLARK HOLLOWAY, JR., and WHITNEY WEINRICH (Gulf Research & Development Co.)

THE compositions of equilibrium vapor-liquid mixtures in the HCl-*n*-butane system were determined at temperatures of 70°, 120° and 180° F. for pressures below 550 lb. per sq. in. The data are presented in tabular form, and also graphically as pressure-composition and as equilibrium constant-pressure diagrams.

●

Determination of Sucrose

E. P. RITTERSHAUSEN and R. J. DeGRAY (Socony-Vacuum Oil Co., Inc.)

A METHOD for the control of sucrose used as a tracer in the determination of connate water in drilling mud is described. Sucrose from any other source, and also any material yielding *d*-glucose upon inversion, may be similarly analyzed.

The colorimetric method employs the fact that the inverted sucrose yields a red color when heated with picric acid and sodium carbonate.

All possible variations of the method have been controlled yielding a reproducibility to within 0.13 mg. of sucrose.

Permanent standards may be made with picric acid and methyl orange.

●

Expansion of Arms Production to Have Postwar Effect A.C.S. Told

(Continued from Page 46)

of fertilizer chemicals that this new capacity will be able to supply farmers will be so large that the basic trends of agriculture might be changed."

Other new things discussed by Dr. Stine for the postwar world were: New fabrics for clothing, steel that will challenge the new light metals, things to be made from the chemical building blocks of hydrogen and carbon that come out of the thousands of chemical compounds in every barrel of crude oil, new houses made cheaply of new materials and painted with new paints, developments in medicine which "may ultimately outweigh by many times even the staggering losses of the world-wide conflagration."

Until a few years ago, he pointed out, magnesium was a structural curiosity, while today, on the average, almost half a ton of it, taken largely from sea water by a chemical process, goes into every fighting plane that is built. After the war the nation's capacity for producing this lightest of all structural metals will be more than double its aluminum output in 1939.

"The nation will emerge from this war," declared Dr. Stine, "with capacities for making plastics, synthetic fibers, nitrates, hydrocarbons, high-octane gasolines, and literally scores of chemical and other raw materials on a scale that only 2 years ago was beyond our comprehension."

"The United States alone," he declared, "is now undertaking to produce 1,000,000 tons of rubber per year in less than 2 years by the manufacture of chemical rubbers from petroleum, alcohol, coal, and limestone."

The American aviation industry is establishing facilities for the manufacture in 1 year, he said, of almost double the number of airplanes it produced during the 37 years of its history beginning with the Wright brothers at Kitty Hawk and culminating in the defense program.

WE MUST WIN THIS WAR

To win the war—and the peace that follows—we must maintain efficient production in all industrial plants. Every man-hour and every machine-hour counts!

Garlock continues to make packings, gaskets and oil seals which give long, dependable service. They help industry maintain full production schedules.

GARLOCK

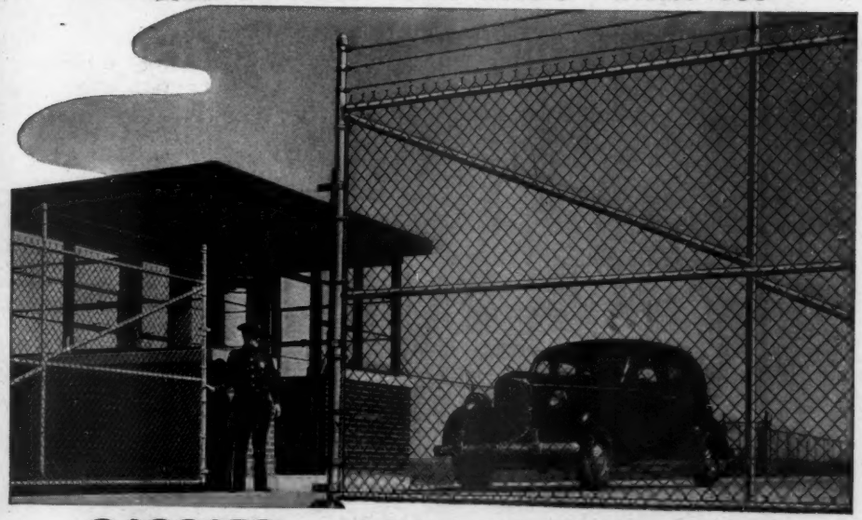
●

THE GARLOCK PACKING CO.
PALMYRA, N. Y.

Tulsa, Okla. Houston, Tex.
Los Angeles, Calif.

PAGE FENCE

America's First Wire Fence—Since 1883



BARRIER AGAINST INTERFERENCE WITH MOTOR FUEL PRODUCTION ● No one can predict where treachery may attempt to strike, but oil plants can and will set up protections. Logically the first barrier should be at all property lines. Two important factors favor Page Industrial Fence. The first woven wire fence was Page Fence, and for 59 years its makers have held a forefront position in major developments. Page also originated localized experience and responsibility in fence engineering and erecting. When you specify Page Fence you deal with a nearby business man—one of 102 technically-trained, long-experienced firms which own their own plants and comprise the PAGE FENCE ASSOCIATION, Headquarters: Monessen, Pennsylvania.

VICTORY FIRST
At the Page mills, men, machines and materials are on an all-out schedule for production of fence to protect plants working on Government orders

PRODUCT OF PAGE STEEL & WIRE DIVISION—AMERICAN CHAIN & CABLE COMPANY, INC., BRIDGEPORT, CONN.

New Shell Plant at Cromwell Shows Trend to Simplification

By HARRY F. SIMONS

The new gasoline plant put into operation by Shell Oil Co., Inc., in the East Cromwell pool in Oklahoma has several outstanding features. The process cycle is extremely simple, automatic controls are kept at a minimum and the requirements for process steam are accurately balanced against the consumption by steam equipment. The plant is important in the nation's war effort, the residue gas being sold to a utility company which manufactures electric current for defense plants and the gasoline going through a pipe line to a refinery where it is used in making aviation fuel

THE new gasoline plant recently completed and put in operation by Shell Oil Co., Inc., in the East Cromwell pool, Okfuskee County, Oklahoma, is the first such plant constructed since the start of the war. It thus gives an indication of the trend in design and construction of similar plants erected to contribute to the war effort. The plant is designed to recover practically all of the butane in the gas and will make a finished product substantially propane free composed of butane and the heavier fractions.

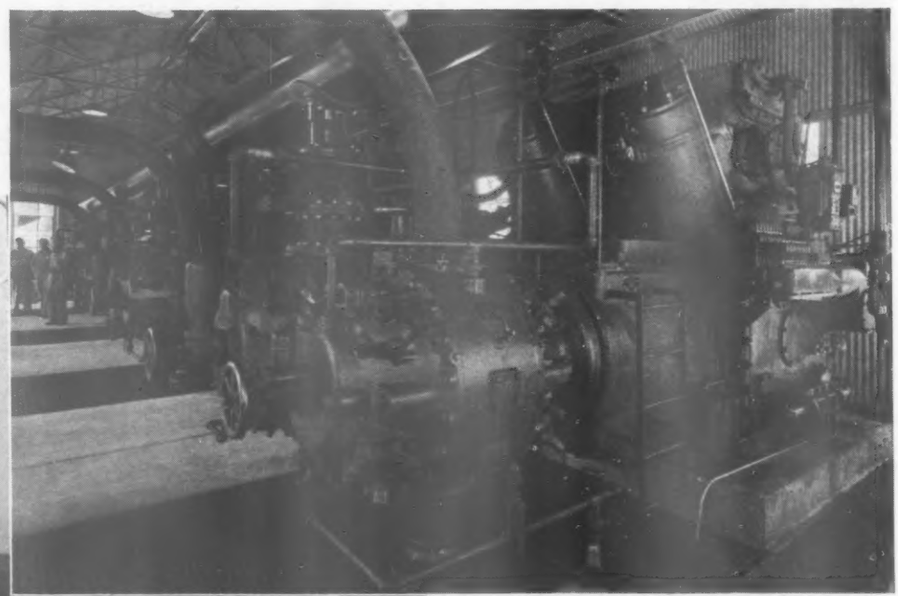
With the plant in operation, the producing situation at East Cromwell approaches the ideal since residue gas (with the exception of that portion used for plant and lease fuel) is sold to a utility company which in turn generates electric current for a number of important defense plants. The finished liquid product (approximately 35 lb. R.v.p.) which contains the butane and heavier fractions is pumped through the company's pipe line along with the crude oil to the Shell refinery at Wood River, Ill., where the fractions are separated and used in the manufacture of high-octane aviation motor fuel.

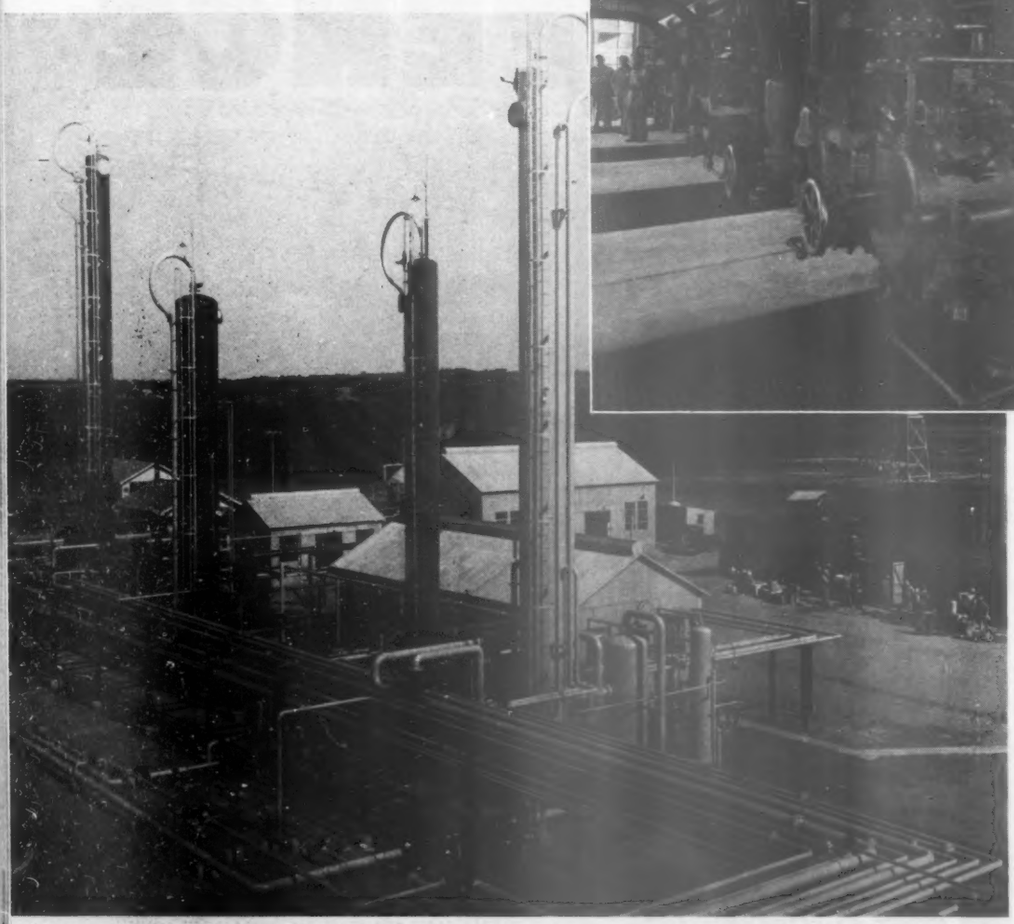
Process Cycle

The plant was designed jointly by the gas-gasoline division of Shell Oil Co., Inc., and Frick-Reid Supply Corp., who did the construction work. It is situated near the center of the oil field and the gas enters through two intake scrubbers on lines coming from the north and south sides of the field. The gas is compressed in two stages to a final pressure of 329 lb. abs.

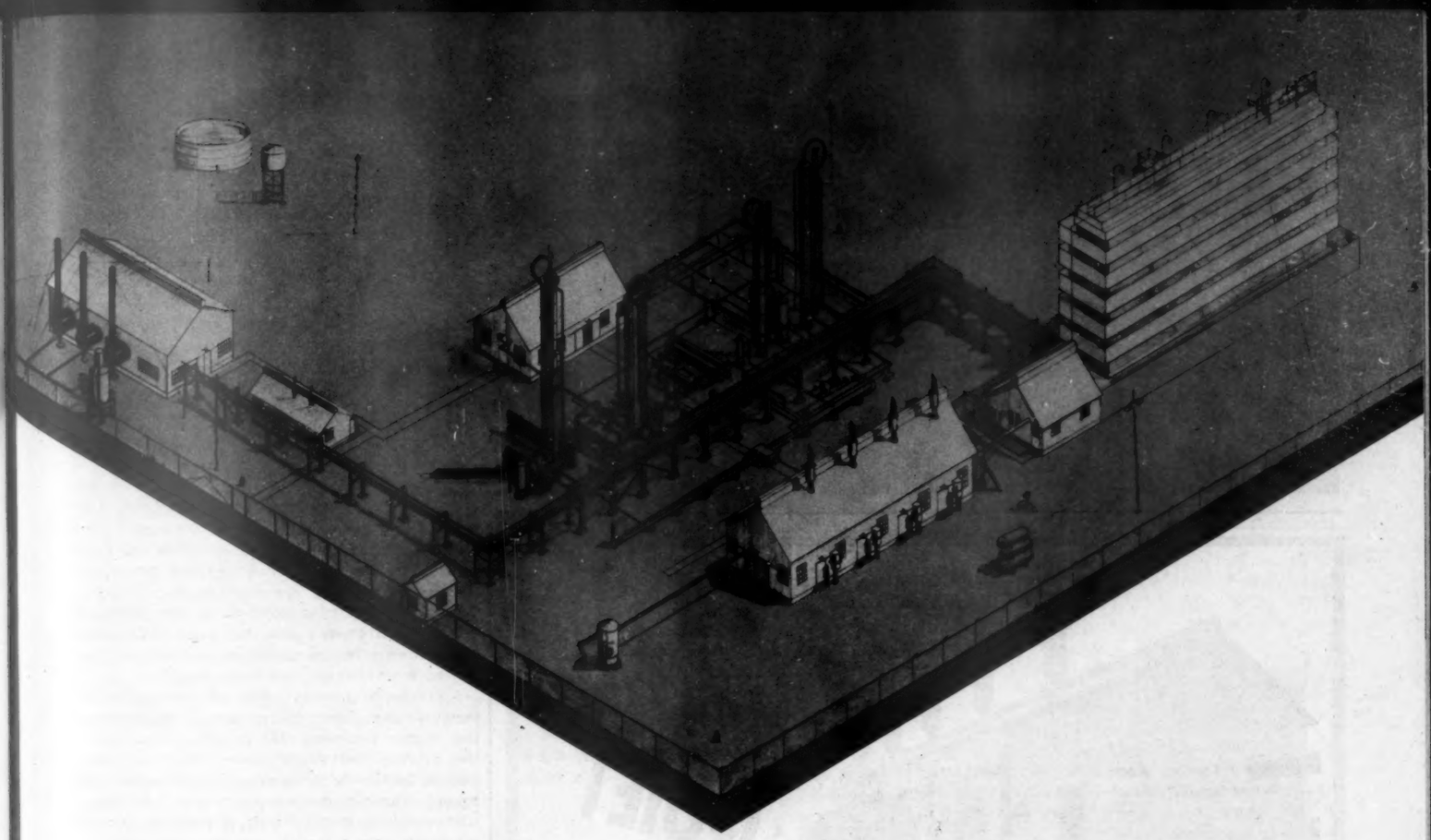
The condensate accumulated through cooling the gas after the second compression stage is flashed at 140 lb. abs., the remaining liquid being delivered directly into the still raw-product make tank. Flashed vapors are delivered to a reabsorber operating at 80 lb. abs. Primary absorption takes place at 320 lb. abs. and the residue gas is sold to a public-utility company. Enriched oil from the base of this absorber is flashed at 140 lbs. abs., these vapors also being delivered to the reabsorber. The remaining rich oil proceeds conventionally through heat exchangers into a rich-oil vent tank, the vapors from this flash being delivered into the rectifying section of the still. The remaining rich oil is preheated with steam at 260 lb. abs. pressure prior to entering the still which is operated at 85 lb. abs. The still overhead vapors are partially condensed, the noncondensable vapors being fed to the reabsorber. Lean oil from the base of the still exchanges heat conventionally with the rich oil, is cooled and then pumped to the main absorber, a side stream being split off to the reabsorber.

The raw product from the still accumulator is stabilized conventionally making a substantially





Left: View from atmospheric cooling tower shows method of supporting piping on stanchions overhead and on pillar blocks immediately aboveground. Building in center is the process pump house and to the left behind it is the electrical generating shed, while at the right is the boiler shed. Above: Four 400-hp. four-cylinder, two-stage, angle-type compressors are used to bring the gas from atmosphere to 329 lb. abs.



ANOTHER

NATURAL GASOLINE PLANT

dedicated to the surpremacy of

AMERICAN AVIATION

and completed with characteristic FRICK-REID precision and attention to functional detail.

ENGINEERING & CONSTRUCTION DIVISION

OF

FRICK-REID SUPPLY CORPORATION

Tulsa, Oklahoma

Group picture taken during test run. The men are A. R. Choate, roustabout; G. H. Woods, roustabout; V. E. Middlebrook, chief engineer, gas-gasoline division, Tulsa; R. H. Sales, engineer; E. A. Thoes, plant superintendent; H. A. Sprinkle, assistant superintendent; W. N. Brown, repairman, and R. F. Purcifull, gas tester and meterman

propane-free product composed of butane and heavier fractions.

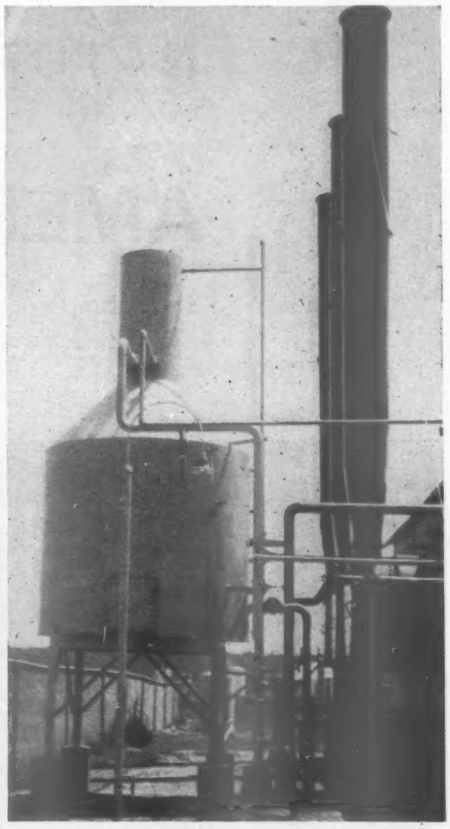
Plant Has Unique Features

The plant is unique in its simplicity because it recovers practically all of the butanes by operating only four bubble towers. The handling of the necessarily large quantity of recycle vapors is accomplished by feeding them to a reabsorber, thus eliminating the undesirable light fractions early in the process cycle.

One of the most outstanding features of this plant is the almost perfect balance between process steam requirements and the exhaust from steam-driven pumping equipment. This was made possible by careful selection of pump drives. All reciprocating pumps are supplied with steam at 260-lb. abs. and exhaust at 90 lb. abs. Stripping steam requirements for the still, and heating requirements in the stabilizer reboiler, are furnished from this exhaust-steam source.

In order to preserve this natural balance of exhaust-steam and process-steam requirements the largest pumping unit in the plant, namely the process and engine-jacket-water centrifugal pumps, had to be powered by a slow-speed (900 r.p.m.), direct-connected gas engine. A steam-turbine-driven standby unit is provided for this service in case of engine or pump failure.

Steam condensate from the rich-oil preheater and still reboiler is delivered through a heat exchanger into a boiler hot well which is operated at atmospheric pressure. The boiler feed water from this hot well is fed countercurrently through the above-mentioned heat exchanger, thus making



Boiler hot well where steam condensate is recovered and used to preheat any makeup water needed in the boilers. The slight haze coming from the stack is the entire exhaust from the plant

Shell Oil Co., East Cromwell, Okla.

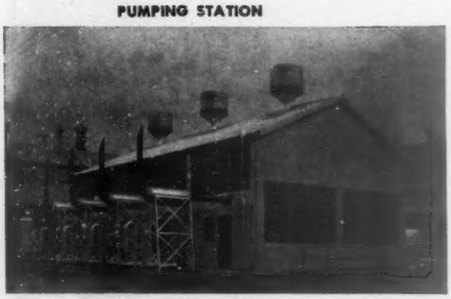
MOBILE WELL SERVICING UNIT

Wherever exhaust noise cannot be tolerated—in oil fields and refineries all over the country—you'll find Burgess Exhaust Snubbers providing quiet exhausts on all types of engines. The new Shell Oil Company plant at East Cromwell, Oklahoma, is another plant where Snubber-equipped exhausts won't cause exhaust noise nuisance.

Because they operate on the patented Burgess snubbing principle, Burgess Snubbers effectively prevent—not muffle—exhaust noise before it can occur. Burgess Battery Company, Acoustic Division, 2823-J W. Roscoe Street, Chicago, Illinois.

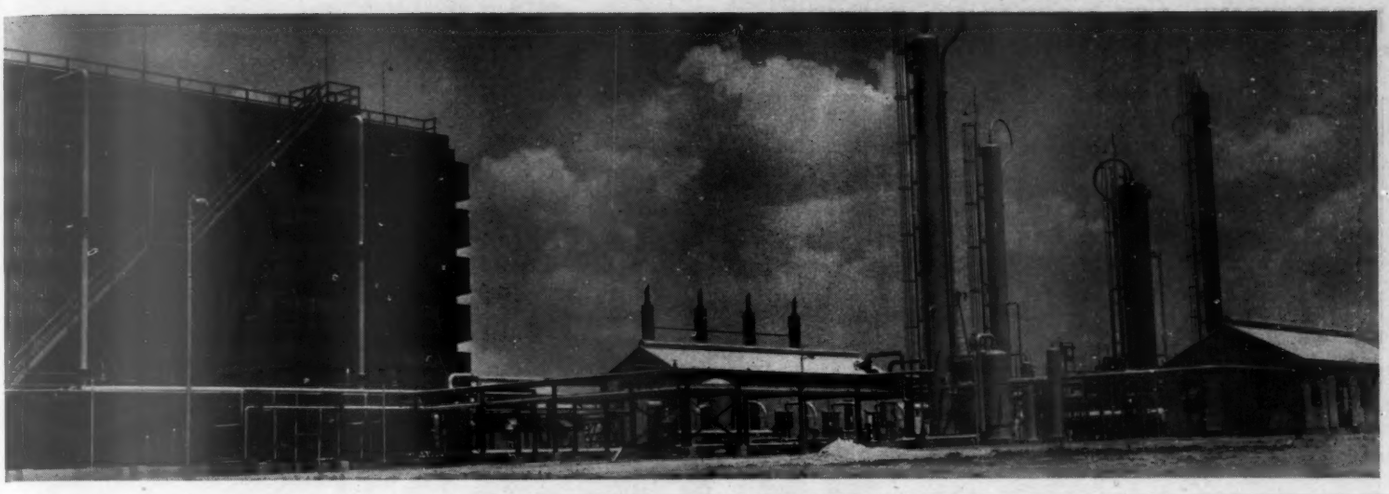
Originators of Patented Snubbing Principle for Quieting Diesel Exhausts.

PUMPING STATION



RECYCLING PLANT

BURGESS DIESEL EXHAUST SNUBBERS



General view of the East Cromwell plant showing relative position of major items

for maximum temperature of the feed water and at the same time preventing loss of water by flashing of the high-pressure condensate when it enters the atmospheric hot well.

Since an adequate supply of good water is a major problem in this locality, the efficiencies effected in the steam system were not only desirable but essential.

The plant fuel system is highly efficient in that no waste of any nature is allowed. The quantity of residue gas from the reabsorber (which is operated at 80 lb. abs.) is sufficient for plant and lease-fuel requirements. None of the gas from the main absorber (which operates at 320 lb. abs.) is needed for this service at present, leaving all of it available for sale. However, an emergency connection from this source is provided so that the reabsorber residue may be augmented in case the quantity ever becomes inadequate. Stabilizer residue gas, which is many plants is vented to the air, is also delivered to gas sale.

All piping is readily accessible, most of it being located overhead on suitable stanchions. However, the pipe does not rest directly on the stanchions but is supported by a lug made from steel plate, the size depending on the size of the pipe. Use of the lug permits the insulating material to almost completely enclose the pipe and cuts down heat loss at the support points.

Main gas lines are set on concrete piers just above the ground with the exception of the low-stage intake header which is located just above the low-stage gas-compressor cylinders. Suitable walkways bridge the gas headers so that the plant attendants may safely perform their jobs.

The balancing of steam requirements has led to the use of some electric and direct-gas-engine power. The electricity for the plant is generated by internal-combustion-engine-driven generators. The pump used to transfer the gasoline from the plant to the pipe line is also gas-engine driven. Electric motors are used to drive the centrifugal pumps for handling the rich oil from the base of the reabsorber.

The automatic control system is conventional. Rate of flow of reflux to the still is controlled by a motor-valve actuated by a temperature controller with thermostat bulb located in the vapor line from the column. As for stabilizer operation, the primary object is to manufacture a propane-free product, retaining all of the butanes. Vapor pressure of the finished gasoline is therefore relatively unimportant so the top temperature is similarly controlled on this unit, allowing the bottom temperature to vary with a constant heat input to the column through the reboiler.

All power equipment is housed in metal buildings with concrete floors. Particular attention has been paid to safety with adequate fire-fighting

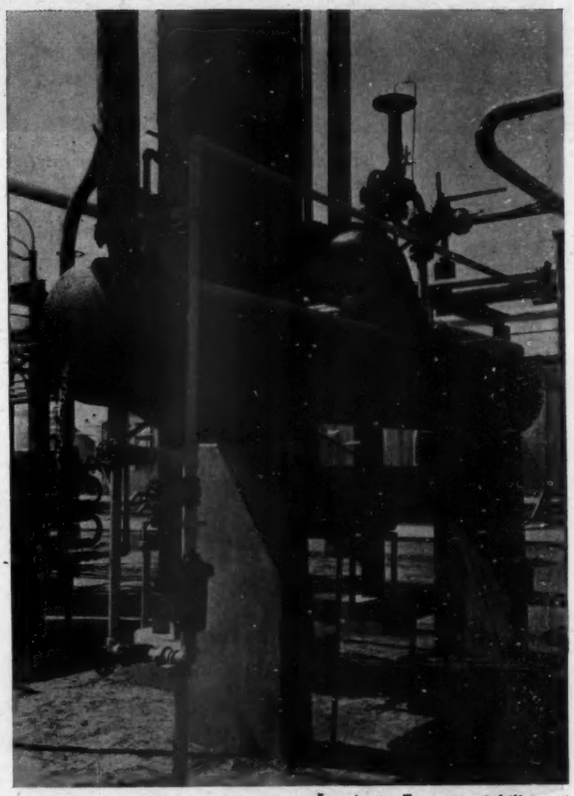
for new Refinery *as Modern as Tomorrow!*

THAT'S the way one engineer expressed himself about Shell's new plant at East Cromwell, Oklahoma. And, "modern as tomorrow" typifies the Armstrong Traps installed there.

The *modern simplicity* of Armstrong design gives you all the advantages you need in traps today and does away with all the troublesome factors:

Only two moving parts. Nothing to bind or stick. Nothing to collapse. Tight-closing, wide-opening heat treated valve for quick, positive action with no wire drawing. No adjustments. No steam loss. Handles air. Handles all ordinary dirt. Big *tested* capacity. Compact size. Side inlet or bottom inlet styles for neat installations.

For low maintenance, fuel conservation and positive condensate drainage, you can't beat Armstrong Traps. Write for catalog. ARMSTRONG MACHINE WORKS, 868 Maple Street, Three Rivers, Michigan.



Armstrong Trap on stabilizer at new East Cromwell, Oklahoma, plant of Shell Petroleum Co.

Armstrong Steam Traps *"OK-ed Everywhere*

Process pump room showing steam-driven reciprocating pumps at right and electrically driven centrifugal pumps at left

installations and a well-designed lighting system which practically eliminates shadows.

The equipment in the plant is of the latest design and it has a number of unusual features. The angle-type compressors have low-tension magnetos but a high-voltage spark is obtained by placing a coil on the spark plugs. The compressors also have 6-in. clearance pockets on the low side and 3-in. clearance pockets on the high side. In addition to the usual lubricating-oil filters the compressors have special strainers. The compressors are also equipped with governors, exhaust temperature gages, oil-bath air filters and silencers.

The water used for cooling the engine and compressor jackets is treated with sodium dichromate to prevent formation of rust. A closed system is used. The water-circulating pumps are driven by a 65-hp. gas engine operating at 900 r.p.m. which is direct-connected to them. The larger of the two pumps has a capacity of 2,200 g.p.m. at 70-ft. head and the smaller has a capacity of 960 g.p.m. at 70-ft. head. A steam turbine drives the standby pumps which have capacities of 960 and 2,200 g.p.m.

There are seven lines entering the atmospheric cooling tower. An 8-in. line carries the jacket cooling water; a second 8-in. line carries the gas from the high-stage side of the compressors; a 12-in. line which divides into two 8-in. lines carries the gas from the low-stage side of the compressors, and a 6-in. line brings the vapor from the stabilizer. The tower is adequate in size and has the requisite number of coils to handle these several streams.

The compressor building, water-circulating pump house, and the atmospheric cooling tower are located on the north side of the plant yard with the building housing the charging pump located on the south side.

The pump house contains two 10-in. by 5-in. by 12-in. simplex pumps (one active and one standby unit) for charging the stabilizer, three 8-in. by 7-in. by 16-in. simplex pumps for the stabilizer and still reflux (the third unit being a standby for both services), two 14-in. by 7-in. by 18-in. duplex pumps (one active and one standby unit) for handling the lean oil, and one 7-in. by 4½-in. by 10-in. simplex pump for utility purposes.

In addition there are two (two-stage 50 g.p.m. 260-ft. head, active and standby) pumps for handling the fat oil from the reabsorber.

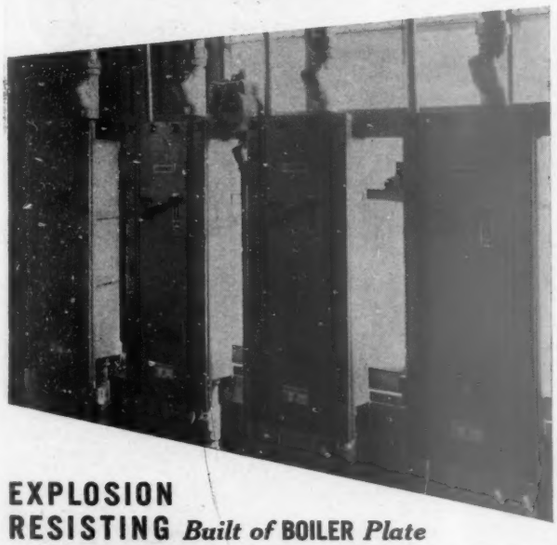
The electrical generating equipment is located in a steel building on the east side of the yard. It includes two 50-hp. two-cylinder, two-cycle gas engines operating at 600 r.p.m. and each driving through V-belts a 30-kw. generator at 1,200 r.p.m. One of these will carry the load during the day time and the second is needed at night as there are 11 floodlights having 1,500-watt lamps. An instrument board holds the necessary equipment for controlling the amperage and voltage of the generators and a synchroscope for synchronizing the generators when placing both on the line.

Steam-generating equipment is located just south of the electrical generating house. There are three 150-hp. oil-field boilers operating at 265 lb. abs. pressure. In addition to the boiler-feed pump there is a steam-driven centrifugal pump for fire fighting. Controls on the boilers are automatic, including necessary equipment for shutting off gas in fire boxes in case of emergency.

As pointed out previously, practically all the steam used in the plant is condensed. The blow-off line is equipped with a scrubber and the boiler-feed water passes through a heat exchanger.

Finished gasoline is stored in the three horizontal tanks having a capacity of 42,000 gal. each. These tanks have hemispherical ends, a design which makes it possible to use ¼-in. plate steel in the head while 11/32-in. steel plate is used in the body. There are also tanks for the storage of lube oil and the mineral-seal oil use for the absorption.

The transfer pump house for delivering gasoline to the pipe line is at the southwest corner of the rectangle and houses a gas-engine-driven duplex pump with a 4-in. bore and a 6-in. stroke. The pump is separated from the engine by a fire wall made of transite as a precaution against ignition of vapors should there be any leakage from the pump. The engine is a six-cylinder type with a 22-hp. rating.



NEMCO

A-C COMBINATION

Motor Starters

at the Shell Oil Company Natural Gasoline Plant

NEMCO Line voltage starters and thermal trip air circuit breakers are designed for Class 1, Group D, Hazardous Locations. Motor Starter applies line voltage to the motor and Air Circuit Breaker acts as a disconnect switch, providing short circuit protection.

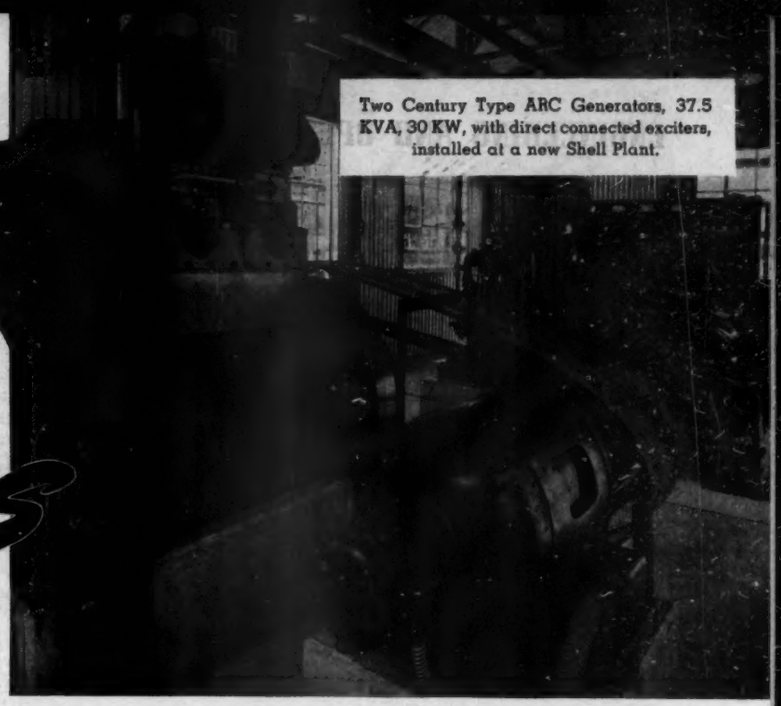
Doors easily removed . . . Control Starter mounted on Starter Pan eliminates flexible leads to enclosure door . . . Enclosure can be flush mounted with doors opening 90 degrees . . . Circuit Breaker, Overload Relay and Control Station EXTERNALLY OPERATED and mounted on steel pan easily removable if desired when pulling in wires.

EXPLOSION RESISTING *Built of* BOILER *Plate*

NELSON ELECTRICAL MANUFACTURING COMPANY

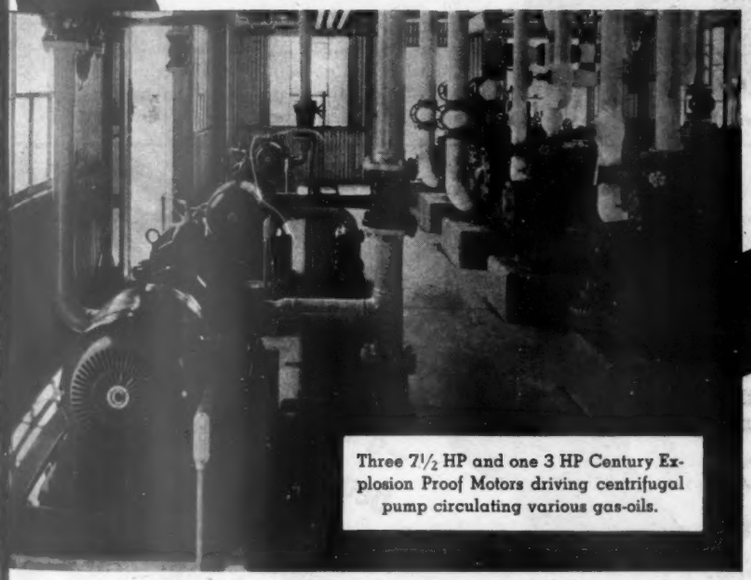
217 NORTH DETROIT TULSA, OKLAHOMA TELEPHONE 5-1241

CENTURY MOTORS AND GENERATORS



Two Century Type ARC Generators, 37.5 KVA, 30 KW, with direct connected exciters, installed at a new Shell Plant.

Electrify New Shell Raw Feed Stock Plant For 100 Octane Aviation Gasoline



Three 7½ HP and one 3 HP Century Explosion Proof Motors driving centrifugal pump circulating various gas-oils.

CENTURY Type ARC Revolving Field Generators

Two of Century's new revolving field Generators supply the electrical power for the Shell gasoline plant producing a raw feed stock for the manufacture of 100 octane aviation gasoline. Both motor and lighting loads depend upon the continuous performance of this Century equipment.

Century Type ARC Generators are built in sizes from 7½ to 75 KVA—4, 6, or 8 pole, 1800, 1200, or 900 RPM, 60 Cycle (corresponding speeds for other frequencies) for belt or coupling drive or direct connected flange mounting. They are offered for continuous duty isolated plants, or as a standby to other available power supply.

CENTURY Explosion Proof Motors

Century Explosion Proof Motors driving centrifugal pumps are operated continuously, 24 hours a day. Designed to meet varying degrees of explosion hazards, Century Explosion Proof Motors carry Underwriters' Laboratories approval for Class 1, Group D hazards. They provide protection against atmospheres containing explosive quantities of gasoline, petroleum naphtha, alcohols, acetone, lacquer solvent vapors, and natural gases.

Use of Century Motors and Generators in this new Shell plant is but another example of the oil industry's wide acceptance of the dependability of Century Motors and their special adaptability for oil field use.

For complete information on Century equipment for oil field power, see your regular supply store, or get in touch with your nearest Century Motor Specialist without delay.

CENTURY ELECTRIC COMPANY

1806 Pine Street St. Louis, Missouri

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Century MOTORS

298

One of the Largest Exclusive Motor and Generator Manufacturers in the World

Unused Ten-Year-Old Power Attests to East Texas Record

THE remarkable record of the East Texas field is attested to by this well-kept 32-ft. band-wheel power, built 10 years ago and never used to pump a drop of oil. When the field was under early development it was an almost unheard of thing for a pool to produce by natural flow for 11 or 12 years. Lease owners, looking ahead to the pumping stage that was expected in a matter of months, equipped their leases for pumping to be ready when the time came.

The pessimistic viewpoint of the operators 10 years ago has turned out to be a national asset today. The drain of a long war is sure to make pumping wells out of most wells that today are flowing. When that time comes 11 good oil wells will be connected to the band-wheel power pictured in the accompanying photograph. With practically all pumping equipment on hand, necessary purchases will be small.

In the East Texas field as a whole one is able to feel the most gratifying result of oil conservation. Imperfect though the regulatory system has been during many periods, oil which 20 years ago would have been dumped on an overburdened market has been saved. The potential of the many flowing wells may prove to be one of the greatest possessions of the United Nations.

Power with 32-ft. band wheel which has never been used

BOOK REVIEW

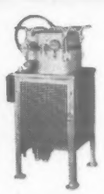
HEAT TRANSMISSION. By William H. McAdams, professor of chemical engineering, Massachusetts Institute of Technology. McGraw-Hill Book Co. First edition. 459 pages. $4.50.

Designed to serve as both a text and reference book, this volume presents fundamental formulas necessary to solve problems in heat transmission regardless of where they are encountered. Data have been obtained from varied sources but have been reduced to a common basis for purposes of comparison, and have also been correlated in the light of the most helpful theoretical analyses. Results of these critical studies are presented as formulas and graphs carefully constructed to give due weight to all the data.

The book is divided into three parts: conduction, radiation, and convection. The appendix contains tables and charts of thermal conductivities, specific heats, latent heats of vaporization, viscosities, and miscellaneous tables. A complete bibliography and an extensive index are included.

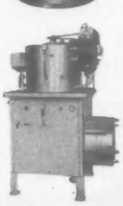
FOR LUBRICATING
OIL PURIFYING
Specify HILCO
A complete line of lube oil purifiers using Fullers Earth – cotton waste and specially prepared filtering agents.

HILCO OIL RECLAIMERS
A simple, economical and foolproof method of restoring contaminated oil to the full value of new oil,–for direct-connecting to one or more Diesel engines for continuous or intermittent operation.



HILCO HYFLOW OIL FILTERS
A superior oil filter for perfect filtering of Diesel engine lube oil–for direct-connecting to one or more engines–continuous or intermittent operation.

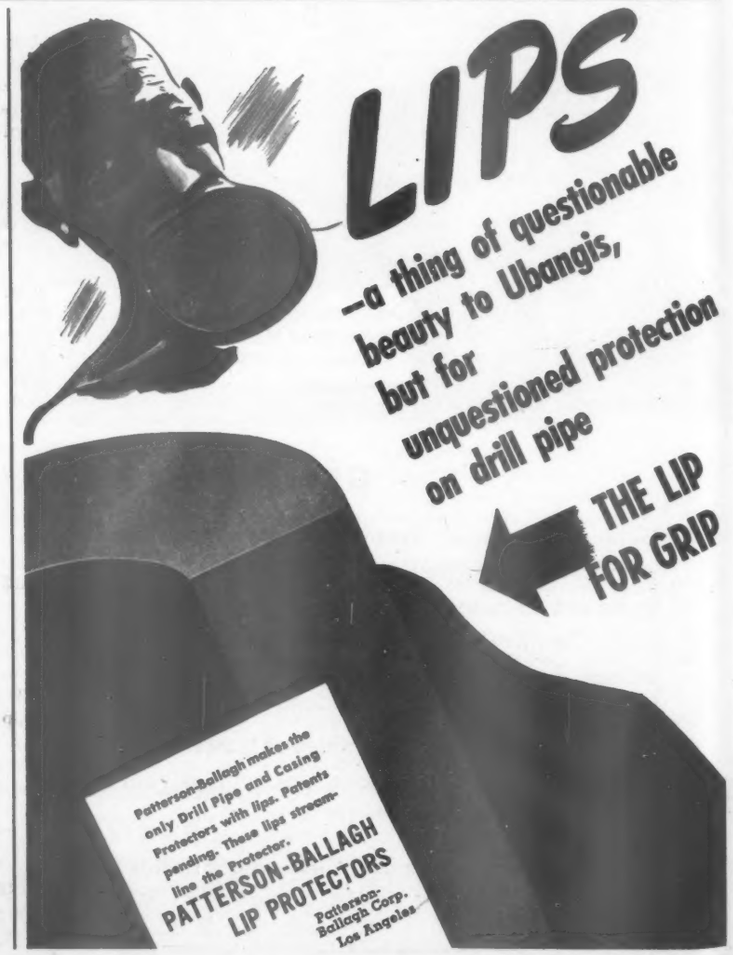
HILCO AIRLINE OIL PURIFIERS
A perfect method for contact oil purifying for complete oil reconditioning. For batch purifying directly from engine lube oil system or transfer tanks.



The HILCO line offers you a *complete* lubricating oil purifier service. *Write for free literature* and see what HILCO operators are doing–then let us help you select a HILCO to take care of "That Particular Job"

OIL PURIFIER HEADQUARTERS

THE HILLIARD CORP., 23 W. 4TH. ST., ELMIRA, N.Y.


LIPS
–a thing of questionable beauty to Ubangis, but for unquestioned protection on drill pipe
THE LIP FOR GRIP
Patterson-Ballagh makes the only Drill Pipe and Casing Protectors with lips. Patents pending. These lips streamline the Protector.
PATTERSON-BALLAGH LIP PROTECTORS
Patterson-Ballagh Corp. Los Angeles

CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

RIG OPERATION

SEPTEMBER 10, 1942

SURFACE-HOLE COST REDUCED BY USE OF PORTABLE DRILLING UNIT

CONSIDERING the expense of operating a heavy-duty rotary-drilling rig, the reduction of unnecessary time that such a rig is tied up on a well represents substantial savings in well costs. Consequently, it is essential that the most effective utilization possible be made of rig time, not only in minimizing idle time but also while making hole.

Some factors affecting rig time as it pertains to well costs have been discussed previously on this page. These have dealt largely with savings in time required for rig moves from well to well and adoption of practices for obtaining maximum footage per working time.

Another phase of extra well cost in many cases is the employment of heavy rigs in drilling surface hole of deep wells. As the depths of surface hole ordinarily can be drilled about as easily and safely with light, portable units which are less expensive to operate it is possible that an operator might realize substantial savings under some circumstances by relieving a heavy rig of this function.

Heavy Set-up on Cement Time

In such a procedure, the heavy rig would be moved on a well after the drilling of surface hole and cementing of surface casing. This reduces its time on the well, and by confining its operation to that part of the hole below the surface pipe, more effective utilization of its greater operating cost results. By moving the rig on during the time required for the surface-casing cement to set, rigging-up time costs are nullified. The procedure is particularly advantageous, however, where the operator is carrying out a development program in a field with a large number of wells to drill.

A major company, developing a large block of leases, requiring a number of wells, in Andrews County, West Texas, has been following this practice successfully, not only facilitating the development program but also effecting appreciable savings in individual well costs. This company has been drilling the surface holes of all these wells with spudders before the rotary rigs are moved on. In each case the surface pipe is landed with the spudding machine, and the rigging up of the heavy machinery takes place either while the cement sets, or at any convenient time thereafter.

Depth of the Andrews County wells being drilled by this procedure is approximately 7,800 ft. They are completed with 5½-in. casing, usually cemented through the productive zone. Drilling conditions make it necessary to use an intermediate string of 9-in., which is cemented at 4,800 to 4,900 ft. The 13⅜-in. surface pipe is 200 to 225 ft. long.

Several Days' Time Saved

Use of a wheel-mounted spudder up to the point in drilling procedure at which the surface string is landed brings about an appreciable saving, especially in cases where one of the company's own heavy rotary rigs is to be employed subsequently. Two or three days' rig time is saved at each well, but there is also another advantage. Successful completion of the well may depend upon having the surface string installed in a straight hole. It is easier to drill a straight surface hole with a spudding machine than with a heavy rotary rig.

In determining the saving resulting from the new procedure, the daily cost of operating a heavy rotary rig can be considered $325 per day, while the cost of operating a spudder approximates $100 per day. An average of 1½ days would be required for a large rig to drill the surface hole, land and cement the casing. The spudder requires an average time of 3½ days for moving in, drilling the surface hole, landing the pipe, and moving away from the location. Thus the actual operation of completing the surface hole can be accomplished at rig cost of $350 using the spudder as against an approximate rig cost of $487.50 when performing the work with the heavy rotary. The spudder can usually be pulled into and away from the location by a heavy truck at a cost not exceeding $75. Thus, a small saving can be expected in regard to rig time.

The most noteworthy saving attending the new procedure results from the fact that no rig is tied up while the cement sets around the surface pipe. The usual cost of tying up a heavy rig in idleness is about $90 per day, which includes interest on the investment, watchmen, deterioration of equipment, etc. Therefore, $180 is saved when the new procedure makes it unnecessary to have the heavy rig in idleness at the location during 2 days waiting on cement.

By making it possible to start the well before the heavy rig is available, the use of the spudder can advance the completion date of the well by 3 or 4 days. This means earlier commencement of revenue and production by the well of a slightly larger share of the oil in the reservoir. However, the monetary value of this advantage cannot be determined with any degree of accuracy.

Summing up the above considerations, an average of about $242.50 can be saved per well under favorable conditions by completing the surface hole with a portable spudder before the heavy rig is moved in. Obviously, there may be far greater incentive in some cases for using the new procedure than can be expressed by this average sum saved. One such case occurs when the heavy rigs are in demand for carrying out a large development program. By saving a few days' rig time at each well, the use of a spudder may obviate the necessity of purchasing an additional heavy rotary rig which otherwise would be required to meet drilling obligations. Another consideration is the fact that situations often develop in the oil industry where legal reasons make it imperative that the drilling of certain wells commence prior to stated time limits. The use of the spudder procedure is very helpful in such cases because by drilling the surface hole only, the legal requirements can be satisfied, and the completion of the well can await the convenience of the drilling company.

WITH 100% COOPERATION AXELSON CAN KEEP YOUR WELLS PUMPING

Shortages of Critical Materials Means Substitution . . .

There is a difference between substitutes and substitution. Substitutes may not be as good as the original, but substitution may sometimes be better.

During the coming months, Axelson is requesting your cooperation in the matter of substitutions for various pump parts.

Although the oil industry is recognized as vital to the war effort, at present much of the steel that would ordinarily be allocated to equipment manufacturers later is now being used in ships, tanks, and guns.

Axelson's facilities are still available for the manufacture of pumps and sucker rods. Lack of material, even with high priorities, is the only thing which has forced a curtailment of production.

Remember Axelson is no more anxious to make substitutions than you are to have them made, for in many instances these substitutions cost more money. As far as Axelson's substitutions are concerned, you can depend on the job they will do in maintaining the standards of quality and performance that have been traditional for over fifty years.

BY WAY OF EXAMPLE HERE ARE A FEW SUBSTITUTIONS...

SEATS AND BALLS

When you and we have exhausted present stocks of stainless steel seats and balls, there won't be any more for the duration. That's going to mean the use of carbon steel and certain steel alloys, as long as they are avaliable. Until a few years ago, carbon steel seats were regarded as entirely satisfactory by the majority in the oil industry, and only through hard selling was Axelson able to introduce stainless steel. Even now, some operators question the advantages gained when used under certain conditions. Seats and balls are one place where substitutions will hit first. It is highly possible that an improved seat and drop may be substituted in alloy or other steels when available.

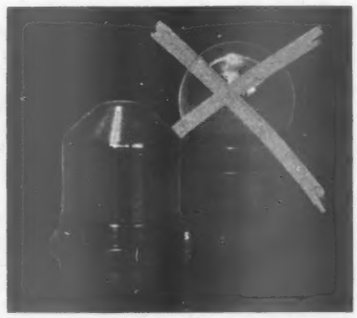
LINERS In their own foundry, Axelson produces grey and alloy iron liners of several types. Up until the present time Axelson has experienced no difficulties in producing these type liners. If conditions arise, where shortage of steel becomes more acute, and forcing a shortage of steel liners, we hope to have a *complete line* of iron liners which we know will produce oil to your satisfaction.

AXELSON 50th YEAR 1892 1942

PLUNGERS Not so many years ago, cup plungers were regarded by some as superior to any other type. Gradually, Axelson's metal to metal principle has been accepted by the industry together with various refinements in plunger design.

It is entirely possible that as present plunger stocks are exhausted, operators will be asked to accept other types of plungers that will render good service, although their wearing qualities may be slightly less than that of the plungers they supersede. These new designs to be of a high quality wear-resisting iron or other materials.

Rest assured that Axelson will continue to furnish the highest quality of plungers commensurate with the steel stocks available.



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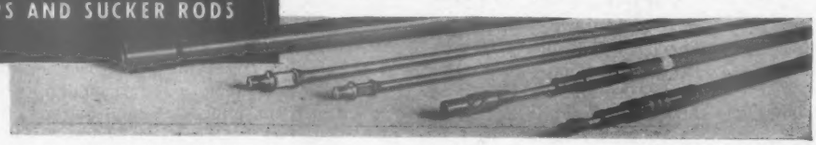

CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

REPLACEMENT

SEPTEMBER 10, 1942

EQUIPMENT REPLACEMENT AT PROPER TIME SAVES MONEY

SOME drilling contractors and oil companies are accused of profligacy because of the rather frequent replacement of equipment. In some cases the equipment retired serves the purpose reasonably well and it would be possible to go on operating for a number of years with it if better equipment were not available.

There is the outstanding case of one company which purchased a large number of small engines for driving pumping units. Careful accounting of the costs of maintenance, down time, and depreciation showed that it would be possible to replace these engines with larger and more expensive ones and obtain a net saving. In this case the retired engines were taken in on the new ones so the salvage-value allowance substantially reduced the investment required.

There is another important factor often overlooked in the replacement of equipment. It is the fact that no one installation is the most economical for all periods in the production life of a field or well. Equipment selected is generally designed to meet economically as many conditions as possible. However, in some cases definite savings can be made by transferring equipment from one pool to another even though some new equipment must be purchased for replacement.

The reverse of this procedure is to take equipment already abandoned and, by repairing and remodeling, make it suitable for further use. A recent case was one in which an engineer found a gear box from a heavy pumping unit, installed the necessary pendulums and made a four-well pumper out of it.

The replacement of any equipment depends to a great extent on its salvage value and on whether or not allowance has been made for its depreciation throughout its life. If there has been no allowance for depreciation, the operator has, in a sense, been converting his investment into earnings.

Depreciation may be considered as a loss which has occurred through use and fair wear and tear. It is considered as one of the fair operating costs of any business and as such is deductible for tax purposes. Sound operators estimate the depreciation and then deduct it annually.

Functional depreciation is depreciation caused by inadequacy to meet additional or changing requirements or by obsolescence.

A radical change in depth of the wells drilled in a particular area may cause a severe depreciation of a drilling rig used in that area in a short time. It is no longer suitable for the work there and its owner can either sell it to a contractor operating in an area where it can be used economically, trade it in on a new rig, or keep on losing money, or losing part of his profit, with it. The same is true of other equipment. By allowing for functional depreciations, the operator can have the money available for these changing conditions.

Several Depreciation Methods

There are several methods of figuring depreciation, each one of which has its particular uses and advantages. Straight-line depreciation is simply the deduction of an annual amount so that the cost of the equipment will be obtained at the time it has to be replaced. In the shrinking-value method there is an annual deduction but the calculation is always based on the remaining value. Actually there is practically no difference in the two.

Another method is to use a fixed percentage of the remaining value. In this case the item being depreciated always has some value remaining. It is used primarily to determine the rate of depreciation to be applied to reduce the cost to an estimated salvage value in a given number of years. If r is the annual rate of depreciation, n the life of the particular piece of equipment in years, s the salvage value at n years and c the original cost, the formula becomes:

$$r = 1\sqrt[n]{\frac{s}{c}}$$

For an engine costing $2,441 with a life of 6 years and an estimated salvage value of $640, this becomes:

$$r = 1 - \sqrt[6]{\frac{640}{2,441}} = 1 - 4/5 = 1/5$$

It can be seen that this method has the added advantage of having the larger sums deducted for depreciation during the early life of the property when the income may be expected to be higher.

Sinking-fun depreciation is preferred by many operators because it automatically takes care of replacement. By the time the equipment is ready to be abandoned or sold, the amounts placed in the fund, together with the interest accrued and the income from the salvage, should be equal to the original cost. In some instances, sinking fund and income from the salvage is expected to return interest along with the original cost.

In the replacement method of figuring depreciation the computations are based on the costs of obtaining a new equipment item at the time of retirement of the old machine. Generally this is based on straight line or fixed percentage basis. The difficulty is encountered in determining how much the new item will cost, say 10 years hence. If this is not done, the base on which the depreciation is figured must be changed each year.

The original cost less the amount of depreciation deducted is considered as the depreciated value of the equipment. This value has no relationship to the salvage value which is dependent on the amount of money which can be secured for that particular item at the time of sale.

The salvage value may be high in some cases, as the operator can use the replaced equipment on another property or the market may be extremely favorable. The condition of the equipment plays an extremely important role as vendors of second-hand equipment will testify. Often the application of a coat of paint will boost the salvage value greatly.

Assembling a Fisher Type 57-S according to engineering specifications detailed on requisition at right.

. . . THIS CONTROLLER MUST BE RIGHT IN EVERY DETAIL!

Your Guarantee OF CORRECT PERFORMANCE AND FUTURE MAINTENANCE . . .

Every FISHER Controller is individually manufactured and assembled to exactly meet your particular requirements. It is specialized equipment that MUST BE RIGHT IN EVERY DETAIL for specific operating conditions.

To perfectly meet these requirements and to guarantee satisfactory performance, FISHER employs a unique manufacturing policy based on the above individual engineering requisition card.

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Experienced FISHER engineers check sizes, capacities and determine construction details to meet the particular operating conditions specified on your order. The controller is then assigned a serial number and complete specifications placed on the requisition.

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PERMANENT MAINTENANCE RECORD!

Finally, the requisition card is placed in a permanent file by serial numbers for future reference. This permanent and complete record of all FISHER controllers provides a source of information from which maintenance parts can be quickly and positively duplicated without delay. It also provides information on the service conditions for which the valve was ordered, when manufactured, and to whom it was shipped.

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MARSHALLTOWN, IOWA

Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

No. 37

SEPTEMBER 10, 1942

EFFICIENCY OF STEAM BOILERS

ALONGSIDE proper design, construction, and capacity, efficiency rates as one of the primary factors which determine what is the most satisfactory boiler for generation of steam. The term efficiency as applied to a steam boiler represents the ratio of the total heat absorbed to the total heat in the fuel burned. When considering a boiler equipped with a superheater or a superheater and economizer,* general practice is to include in the efficiency determination a consideration of these appurtenances. In other words, the total heat-absorbing surfaces of a boiler installation are usually included in an efficiency calculation.

The difference between 100 per cent efficiency and the actual efficiency of any boiler is due to certain unavoidable and often avoidable, losses of heat in the process of transmitting heat energy from the fuel to the steam delivered by the boiler. These losses, in a boiler fired with natural gas, may be itemized under the following:

1. Loss due to water formed in the burning of hydrocarbons in the natural gas. This loss is represented by the heat required to convert liquid water from entering fuel temperature to the superheated condition in which such water leaves with the stack gases.

2. Loss due to moisture contained in fuel gas. This loss is similar to the first item, except that the water enters the furnace as a vapor rather than as a liquid. Often the gas used for fuel will contain appreciable water vapor, the amount of which can be determined by a humidity test of the gas used for fuel. The loss is represented by the difference between the total heat of the water vapor at stack gas temperature and at the fuel temperature before it enters the combustion space. This loss is comparatively small; in fact, from a practical standpoint, it is negligible.

3. Loss due to moisture in the air used for combustion. This loss is of the same nature as Item 2; although it may be somewhat larger, due to the fact that the volume of air entering is considerably greater than the volume of fuel burned. Still, this loss is small as compared to some of the other losses.

4. Loss due to heat carried away by the dry stack gases. This loss is represented by the heat required to raise the temperature of these gases from inlet fuel and air temperature up to the temperature of the stack gases.

5. Loss due to incomplete combustion of the fuel. This loss can be determined by the analysis of the stack gases to detect the quantities of carbon monoxide or unburned hydrocarbons in the stack.

6. Radiation loss. Although losses by radiation are difficult to determine accurately, they may be rather large under certain conditions. These losses may be appreciably reduced through the use of insulation on the boiler and steam piping.

7. Unaccounted losses. From every boiler there are some losses that cannot be charged to any of the above items.

From the standpoint of design, construction, or operation, a boiler test with sufficient data taken to determine each of the above items may lead to the use of possible measures for reducing some of the losses in order to increase the efficiency of the boiler. Such an increase in efficiency means that the same steam delivery can be maintained with less fuel cost. However, such testing and economy measures often cannot be justified in oil-field operation due to plentiful supply of gas at low cost.

The necessary data and type of calculation involved in the determination of the efficiency of a gas-fired boiler is illustrated as follows:

Example 1.

Problem.—Given the following data on a boiler equipped with a superheater:

Steam pressure, lb. per sq. in., ga.	236
Feed-water temperature, °F	75
Steam temperature, °F.	500
Volume of gas fired per hour, standard cu. ft.	9,000
Gross heating value of gas, B.t.u. per standard cu. ft.	1,065
Feed water used per hour, bbl.	14.5
Atmospheric pressure, lb. per sq. in.	14.0

Calculate the efficiency of the boiler.

Solution.—The total heat in the fuel burned per hour is (9,000 × 1,065), or 9,585,000 B.t.u.

By use of superheated steam tables as given in Installment 33, the total heat in 1 lb. of superheated steam at (236 + 14), or 250 lb. per sq. in., abs., and 500° F., is found to be 1,264.70 B.t.u. above 32° F.

From the temperature table for saturated steam, Table 1, Installment 31, it is found that the heat in 1 lb. of feed water at 75° F. is 43.04 B.t.u. above 32° F.

So, the amount of heat added in the boiler to 1 lb. of water is (1,264.70 — 43.04), or 1,221.66 B.t.u.

One barrel of water weighs 42 × 8.34, or 350.28 lb. (See Installment 1).

The weight of water generated into steam per hour by this boiler, then, is 14.5 × 350.28, or 5,079.06 lb.

Then, the total heat absorbed per hour in the boiler is 5,079.06 × 1,221.66, or 6,204,884 B.t.u.

Now,

$$\text{Boiler efficiency} = \frac{\text{Heat output}}{\text{Heat input}}$$

$$= \frac{6{,}204{,}884}{9{,}585{,}000} = 0.6473 = 64.73\%$$

It should be realized that the average all-year operating efficiency of any boiler will, in general, be well below the efficiency of the same boiler as obtained for short periods of time under test conditions. This lower operating efficiency may be attributed to the varying load factor under field conditions and often to field conditions, not conducive to high efficiency, that may not be reproduced on a boiler test.

Stationary boilers of the type used in power plants may, under good operating conditions, show efficiencies close to 90 per cent. Most oil-field boilers, under what may be considered normal operation will show efficiencies varying from 50 to 60 per cent. Inefficient operating practices may lower the efficiency of boilers considerably below 50 per cent. On the other hand, more efficient design, construction, and operation may raise the efficiency to above 70 per cent.

Possible means of increasing or maintaining the efficiency of oil-field boilers consist of:

1. Use of insulation on boiler and steam piping.
2. Use of superheaters.
3. Use of feed water which is free from dirt and scale-forming minerals.
4. Elimination of steam leaks.
5. Use of condensers.
6. Use of feed water preheaters.
7. Burner design and adjustment.
8. Avoiding excessive overload of the boiler. However, a boiler will operate at capacities considerably above its rated capacity without excessive reduction of the efficiency.

*An economizer is a closed heater which utilizes the heat in the spent stack gases for preheating the boiler feed water.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 38

SEPTEMBER 10, 1942

PREHEATING OF BOILER FEED WATER

THE use of waste heat at a boiler to heat feed water before it reaches the boiler will result in an increase of the over-all efficiency of the boiler plant. Such increased efficiency means reduced fuel consumption for a given steam output.

Feed-water heaters may be classified into three main groups:

1. Closed heaters.
2. Open heaters.
3. Economizers.

The first two classes use steam, usually exhaust steam, as the heating medium, while the third one utilizes heat from the boiler stack gases.

In the *closed-type* heater, the heat is transmitted through metal walls. The steam and water are not in direct contact. Because of this lack of direct contact, the water can never be brought up to the temperature of the steam. Formation of scale on the water side of the heat-transmitting surface may lead to still lower efficiency of heat transfer from the steam to the water. However, where there is oil in the exhaust steam, it may be advisable to use this closed-type heater in preference to the open-type.

In a closed-type heater, any dissolved gases in the feed water entering the heater are not allowed to escape after heating, but pass on into the boiler. Corrosion of the boiler from certain of these gases, such as oxygen and carbon dioxide, may result if the gases are not removed from the water.

Open-type feed-water heaters are built so that the feed water and the exhaust steam come into direct contact in a chamber. The feed water in this type of heater is brought to the temperature of the exhaust steam, and gases carried in solution by the water entering the heater are allowed to escape with a resulting reduction in the possibility of boiler corrosion. Open-type heaters must be located well above the feed-water pump suction since pumps will not lift hot water by suction.

The open-type heater should be equipped with an oil separator to remove the oil that comes from the engines and pumps.

If the feed water contains temporary hardness, the heating of the feed water may cause precipitation of such material. If so, the precipitate can be removed by use of filters, thus preventing the accumulation of scale and sludge in the boiler.

An economizer consists of an assemblage of water-filled pipes placed in the path of the hot flue gases at the base of the stack after the gases have left the boiler heating surfaces. Economizers are seldom used on oil-field boilers because due to the increased weight of the boiler unit, its portability is reduced.

The saving in fuel due to the heating of the feed water by use of waste heat may be computed from the following formula:

$$S = \frac{100(h - h_1)}{H - h_1}$$

where

S = fuel saving, per cent
h = heat of the liquid at the temperature of the feed water after heating, B.t.u. per lb., above 32° F.
h_1 = heat of the liquid at the temperature of the feed water before heating, B.t.u. per lb., above 32° F.
H = total heat of steam being delivered by boiler, B.t.u. per lb., above 32° F.

Values of h, h_1, and H may be taken from a set of steam tables.

Table 1 shows the fuel saving resulting from various increases in feed temperatures at a boiling pressure of 180 lb. per sq. in., gage, when delivering dry saturated steam. The saving at other pressures will vary slightly, being less for a given temperature rise as the pressure increases and greater as the pressure decreases.

Example 1.

Problem.—Calculate the per cent saving in fuel that can be effected by utilizing waste heat for heating boiler feed water from 80° F. to 180° F.

1. When the boiler is delivering dry saturated steam at 150 lb. per sq. in., gage.

2. When the boiler is delivering dry saturated steam at 250 lb. per sq. in., gage.

Solution.—1. When steam pressure is 150 lb. per sq. in., gage (165 lb. per sq. in., abs.). From the set of steam tables used in previous installments:

$h = 147.91$
$h_1 = 48.02$
$H = 1{,}195.9$

Then,

$$S = \frac{100(147.91 - 48.02)}{(1{,}195.9 - 48.02)} = 8.71\%$$

2. When steam pressure is 250 lb. per sq. in, gage (265 lb. per sq. in., abs.). From the steam tables:

$h = 147.91$
$h_1 = 48.02$
$H = 1{,}202$

$$S = \frac{100(147.91 - 48.02)}{(1{,}202.0 - 48.02)} = 8.66\%$$

It is seen from Table 1 that the saving at a steam pressure of 180 lb. per sq. in. gage and the same temperature rise is 8.7 per cent. So within the range of steam pressures commonly used, the change in fuel saving with steam pressure is negligible.

TABLE 1—SAVING IN FUEL DUE TO PREHEATING FEED WATER PER CENT*
Gage Pressure, 180 lb.

Temp. of water entering preheater, °F.	Temp. of water leaving preheater, °F. 120	140	160	180	200	250	300
32	7.35	9.02	10.68	12.36	14.04	18.20	22.38
35	7.12	8.79	10.46	12.14	13.82	18.00	22.18
40	6.72	8.41	10.09	11.77	13.45	17.65	21.86
45	6.33	8.02	9.71	11.40	13.08	17.30	21.52
50	5.93	7.63	9.32	11.02	12.72	16.95	21.19
55	5.53	7.24	8.94	10.64	12.34	16.60	20.86
60	5.13	6.84	8.55	10.27	11.97	16.24	20.52
65	4.72	6.44	8.16	9.87	11.59	15.88	20.18
70	4.31	6.04	7.77	9.48	11.21	15.52	19.83
75	3.90	5.64	7.36	9.09	10.82	15.16	19.48
80	3.48	5.22	6.96	8.70	10.44	14.79	19.13
85	3.06	4.80	6.55	8.30	10.05	14.41	18.78
90	2.63	4.39	6.14	7.89	9.65	14.04	18.43
95	2.20	3.97	5.73	7.49	9.25	13.66	18.07
100	1.77	3.54	5.31	7.08	8.85	13.28	17.70
110	0.89	2.68	4.47	6.25	8.04	12.50	16.97
120	0.00	1.80	3.61	5.41	7.21	11.71	16.22
130	....	0.91	2.73	4.55	6.37	10.91	15.46
140	....	....	1.84	3.67	5.51	10.09	14.68
150	....	....	0.93	2.78	4.63	9.26	13.89
160	....	....	....	1.87	3.74	8.41	13.09
170	....	....	....	0.94	2.83	7.55	12.27
180	....	....	....	....	1.91	6.67	11.43
190	....	....	....	....	0.96	5.77	10.58
200	....	....	....	....	....	4.86	9.71
210	....	....	....	....	....	3.92	8.82

*From "Steam," Babcock & Wilcox, 1930.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

REFINERY ACTIVITY AND EXPANSION

Twice as Many Refineries to Be Producing Aviation Gasoline by This Time Next Year

MORE than 32 petroleum-refining companies will be producing 100-octane gasoline by the third quarter of 1943, according to predictions of Standard Oil Co. (New Jersey) chronicled in the current issue of The Lamp.

Capacity of the industry to substantially increase its production of 100-octane motor fuel were said by the publication to be limited only by the availability of critical materials and time for fabricating them into plants.

Sixteen refiners in the United States are now producing 100-octane gasoline and this number, declares The Lamp, Standard Oil Co. (New Jersey) publication, will be doubled by this time next year. Superfuel production is still one of the major problems of the manufacturing branch of the industry despite recent emphasis on recovery of components of synthetic rubber.

These 16 companies are now manufacturing 100-octane gasoline: Continental Oil Co., Gulf Refining Co., Humble Oil & Refining Co., Magnolia Petroleum Co., Phillips Petroleum Co., Shell Eastern Petroleum Co., Shell Union Oil Co., Sinclair Refining Co., Standard Oil Co. of California, Standard Oil Co. (Indiana), Standard Oil Co. of Louisiana, Standard Oil Co. (Ohio), Texas Co., Tide Water Associated Oil Co., and Union Oil Co. of California.

"The history of 100-octane development is particularly significant today," The Lamp declares, "because it affords a typical example of how processes originating within a small group have been made available through licensing to a wide circle of refiners. Were it not for this wide exchange of patents and 'know how' the almost unbelievable rapid expansion of 100-octane output, in spite of the swift movement of world events, could never have happened."

Time-Table of Requirements

As a measure of the industry's race against world events, The Lamp invites consideration of the following time-table:

"In May 1940 the president called for 50,000 planes for 1942. Hundred-octane refining capacity already in existence or under consideration at that time was considered ample by the Government.

"Establishment in 1941 of gasoline purchases under the Lend-Lease Act and the arrival of the British Petroleum Mission emphasized that the United States was expected to supply much of the Allied needs, as well as build up reserve capacity for itself.

"The German attack on Russia added the U.S.S.R. to the nations looking to Uncle Sam for a substantial part of their aviation-fuel requirements.

"With Pearl Harbor and the explosion of war in the Pacific the plane-production schedule was again revised upwards, with emphasis on heavy bombers—which consume more fuel.

"Up to this point the entire expansion of aviation-gasoline capacity had been financed with private capital. Now for the first time the Government advanced funds and provided high priorities for equipment to help swell 100-octane production for war needs.

"Early in 1942, the president's previous estimate of 50,000 planes needed this year was jumped to 60,000, with 120,000 planned for 1943. Scheduled engine-production figures reached astronomical heights.

"The ferry command was organized and movement of planes and cargoes by air across the North Atlantic and to the Middle East, Far East, and Australia swelled to unprecedented proportions, with many planes now flying that formerly traveled on shipboard.

"The submarine toll of cargo vessels may add still another heavy burden to aviation-fuel production—large cargo planes to thwart the undersea menace. Such planes would require more high-octane fuel even than bombers in view of their need to carry maximum loads for great distances without refueling.

"Material shortages became critical, making construction of expanded facilities much more difficult.

Three Principal Components

"Hundred-octane fuel today has three principal components—a base stock of 70 to 80-octane rating, a blending stock which raises the fuel to about 85, and tetraethyl lead, which brings it up to 100. Here is about the proportion in which superfuel is believed to be derived at present from the various processes used in its manufacture:

"*Base stock.*—Seventy per cent from natural naphthas, 20 per cent by catalytic cracking, and 10 per cent by hydrogenation.

"*Blending stock.*—Ninety-five per cent by alkylation and 5 per cent by hydrogenation.

"*Tetraethyl lead.*—Less than ¼ liquid ounce per gallon.

"Briefly, these were the principal steps in its development.

Blending Stock

"1. Commercial use of 100-octane began in 1935. Hydrogenation figured prominently in the methods used at that time to produce the necessary blending agent, and in principle the procedure was similar to the original laboratory process for making isooctane for reference purposes.

"2. Though the original commercial process for making 100-octane blending agent was—and still is—satisfactory, it has since been largely replaced by a newer method called alkylation. Some of the first patents specifically covering the alkylation process were issued in England to the Anglo-Italian Oil Co. and the Royal Dutch-Shell. Standard Oil Co. (New Jersey), Texas Co., and Uni-

Sketches of Plant Operators . . .

HARRY F. GLAIR, who as general manager of manufacturing of Standard Oil Co. of Indiana helps direct the company's refineries in their war production of fuels and lubricants for the armed forces, war industries and the farm front, will be awarded a gold pin in recognition of 30 years of continuous service October 22, 1942. He has actually been with the company 2 years more but they were before he left employment to go to college.

Mr. Glair was born in Chicago and after graduation from Hyde Park High School in 1906 went to work at Standard's Whiting, Ind., refinery as a timekeeper. Two years later he was transferred to the Wood River, Ill., refinery, where he worked as a clerk and draftsman. Taking time off for a course in mechanical engineering at the University of Illinois, he finished in 1912 and returned to the Whiting plant as an engineer.

In 1914 Mr. Glair was advanced to assistant superintendent of the paraffin works. Various promotions made him superintendent of the paraffin department in 1920, assistant general superintendent of the Whiting refinery in 1921, general superintendent in 1927 and manager in 1929. While in the paraffin department he was responsible for patents covering improvements in the removal of wax from oil as well as novel improvements in the manufacture of candles.

Transferred to Chicago general offices in 1931 as assistant general manager of manufacturing, his promotion to general manager followed in 1933. He was elected a member of the board of directors of the company in 1935. He is also a director of a subsidiary, Stanolind Pipe Line Co.

Mr. Glair is in general charge of operating the Standard of Indiana's six refineries located at Whiting, Ind.; Wood River, Ill.; Sugar Creek, Mo.; Neodesha, Kans., Casper, Wyo.; and Greybull, Wyo. The plants have a crude-oil capacity of approximately 200,000 bbl. daily. Major changes have been made in the manufacturing operations in recent months in order to increase the output of war products.

In his leisure moments Mr. Glair enjoys home life and the usual entertainments and applies his powerful physique to swimming and golfing, among the sports. He is married and has a grown daughter, is a Mason and a Zeta Psi. He built his present home on Vollmer road in suburban Flossmoor.

FIRE and how to fight it!

HOW DO YOU KILL FLAMMABLE LIQUID BLAZES?

Q. What are flammable liquid fires?

A. They are fires in oils, gasoline, solvents, paints, lacquers, and the like. Authorities call these Class "B" blazes and recommend extinguishers with a *smothering* or *blanketing* action.

Q. Will every type of extinguisher work on all kinds of flammable liquid fires?

A. No! Water streams, for example, are usually ineffective and extinguishers which employ a liquid stream will not handle three-dimensional blazes.

Q. What is a three-dimensional fire?

A. It is a fire which burns at more than one level, as when a container ignites and spills a flowing stream of burning liquid over its sides. Carbon dioxide extinguishers readily handle this type of fire. Work from the bottom up. Kill the fire at the lowest level first.

Q. What is a running fire?

A. It is a flammable liquid blaze which occurs when a flowing stream becomes ignited. You fight this fire by working against the flow of the liquid. If a pipe is leaking, start at the extreme edge of the fire and work back toward the pipe. If a container is spilling its burning contents, work toward the container.

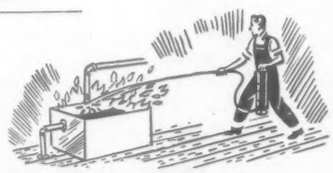
Q. What is a spill fire?

A. This is simply a fire resulting from liquid spilled on the ground or on the floor. Don't try to kill all of this fire at once, if it covers a large area. Start at one point, smother all flames there and continue, part by part, until the entire fire is out.

If you are outdoors, *keep wind at your back.*

Q. How about fires in open vessels?

A. Always "bank" stream from foam or vaporizing liquid extinguishers off inside wall of container. Don't squirt directly on burning surface. With carbon dioxide units, aim discharge at nearest portion then work up on fire with slow sweeping motion.



MAKE EXTINGUISHERS LAST LONGER

Since December 1941 Walter Kidde and Company has had an unusual war job . . . to make products that *save* fighting men's lives. These products include high pressure containers for aviation use, special type built-in extinguishing systems, crash trucks, and various flotation equipment.

Since we have fewer Kidde extinguishers* to sell, we are trying to make your existing fire fighting units more effective.

If you want reprints of this series of advertisements, just write to

Walter Kidde and Company, Inc., 934 West Street, Bloomfield, New Jersey.

Kidde

SNUFFS OUT FIRE

*formerly known as "LUX" extinguishers

versal Oil Products Co. were also active in this field and had important patents existing or pending.

"3. Since several companies were obviously proceeding along parallel lines in alkylation research, it became apparent that overlapping patent rights would ultimately lead to a hopeless tangle of litigation. Consequently in April 1939 an agreement for the exchange of patent rights and information was concluded among the five companies involved so as to permit more rapid development of this important process. Licenses and 'know how' were offered widely to the industry.

"4. The royalty on these licenses, which include all the necessary process and engineering data, is less than ¾ cent a gallon to private concerns and ½ cent in the case of product either sold to the Government or intended for federal agencies. The latter figure is to be reduced to ⅛ cent a gallon by the middle of 1943.

"5. A new type of alkylation process, pioneered chiefly by the Universal Oil Products Co., and differing substantially from others, is now being widely applied and will contribute in an important degree to production of the blending agent for 100-octane manufacture.

Base Stock

"6. With the rapid upward revisions of 100 octane-fuel requirements, the petroleum industry quickly saw the need for new sources of high-octane base stocks to be used with synthetic-blending agents in superfuel manufacture.

"One method for boosting base-stock production was hydrogenation. For years Jersey's hydro plant has produced more synthetic-base stock than all other processes combined. Hydrogenation is, of course, available to other refiners under the original licensing arrangement.

"7. By this time still newer processes had entered the picture, chief among them the widely talked of catalytic cracking methods. At present there are two types:

"(a) *Lump catalyst.*—(either in a fixed or moving bed). The best known of this type is the Houdry process which was adopted by the Sun Oil Co., Socony-Vacuum, Tide Water, and Standard Oil of California.

"(b) *Fluid catalyst.*—This type, using catalyst in powdered form suspended in gas or vapor, was conceived and first demonstrated commercially by Standard Oil Co. (New Jersey). The first full-scale plant was completed this year by an Esso affiliate and it is now operating successfully. It will be followed by 30 or more being built by Jersey and other units in the industry under license.

"8. In the beginning, aviation fuel made by catalytic cracking was unacceptable because of certain chemical limitations. Intensive cooperative work by airplane-engine builders, oil refiners, and government agencies has since gotten the 'bugs' out of it and widened the field of its usefulness until today catalytic cracking is an increasingly important factor in supplying the expanding requirements for 100-octane. In fact, with the completion of catalytic cracking plants now scheduled, it is expected that well over half our 100-octane base stock will ultimately be supplied by this process.

"9. While all these complicated processes and new techniques were being developed, refiners had not been neglecting simple distillation. Standard Oil Co. (New Jersey) and others have succeeded recently in bringing this ancient art to such a high degree of perfection that the separation between products is figuratively knife-sharp—so much so, in fact, as to make possible the 'unscrambling' of gasolines and the recovery of minute percentages of previously 'lost' high-octane fractions. Jersey's complete technical information on this procedure—known as super-fractionation—is in the hands of the Government and its first commercial plant will be in operation this year."

Pipe-Line Activity

Legal Formalities Clear Path for Project Five's Products Line to Mississippi River

WASHINGTON, D. C.—Legal formalities have been completed for the incorporation and functioning of Project Five Pipe Line Corp., which is to construct and operate a 10-in. gasoline line from El Dorado to Helena, Ark.

The incorporators of the new company are Gulf Refining Co., Socony-Vacuum Oil Co., Inc., Texas Co., Lion Oil Refining Co., and Premier Oil Refining Co. of Texas.

Although practically all of the right-of-way has been acquired and much of the other preliminary work has been completed, the project was not officially launched until last week when the Government took the legal steps stipulated by the five companies in their original agreement of July 4.

President Roosevelt has issued a proclamation giving the project a national-defense status under the Cole Pipe Line Act and other statutes, and Chairman Donald M. Nelson of the War Production Board has certified to the Department of Justice that the agreement is necessary to the war, thus giving immunity from antitrust actions.

The contracting parties anticipate that the cost of the pipe line and facilities to be constructed will not exceed $3,500,000 and capital stock will not be authorized in excess of $4,000,000. The five contracting companies have agreed to purchase capital stock of the Project 5 corporation in the following percentages: Gulf, 45 per cent; Socony-Vacuum and Texas Co., 24 per cent each; Lion, 5 per cent; Premier, 2 per cent.

Any person or corporation who in the first 6 months of 1942 was engaged in the business of refining crude oil in District 3 or transporting either crude oil from District 3 to be refined in District 1, or petroleum products from District 3 for distribution in District 1 may become a party to the Project 5 agreement up until the end of October. Other than the five original contracting companies may become a subscriber within 60 days from August 31, 1942, for the stock of Project Five Pipe Line Corp., on such fair and equitable basis with respect to duties and liabilities thereby assumed as may be agreed between such person or corporation and the primary concerns.

Facilities of the line which are expected to deliver 55,000 bbl. of gasoline daily to barge-loading docks on the Mississippi River are to be available to the contracting shippers in proportion to their respective stock interests.

In declaring the Project 5 line as essential for national defense, the president's proclamation exempts the system from provisions of the Interstate Commerce Act and from several sections of the Elkins Act until April 1, 1948.

Half of Phillips' Products Line in West Texas Finished

Approximately half of Phillips Petroleum Co.'s products line from New Mexico and West Texas to its Panhandle refinery at Borger, Tex., has been completed.

The products system will consist of 248 miles of 8-in., between Hobbs, N. M., and Borger with a 6-in. lateral line extending from near the Texas-New Mexico border to the Goldsmith field in Ector County, West Texas. The lateral line will extend 60 miles and approximately 15 miles of this artery have been laid.

Lone Star Building New Line To Warren Gasoline Plant

DALLAS, Tex.—Several new pipe-line projects and a large compressor station have been completed recently or will be finished in the next few weeks by Lone Star Gas Co., giving the company considerably greater flexibility in supplying peak winter requirements.

The new compressor station is located east of Waco, Tex., on the north bank of the Brazos River at the crossing of the company's 16-in. trunk line. Nine Cooper compressor engines of 170 hp. will be operated and they will handle a peak load of about 40,000,000 cu. ft. of gas. Plant construction is under the supervision of A. B. Hemphill, assistant engineer.

A new line from Durant, Okla., to the Cumberland field where connection will be made with Warren Petroleum Corp.'s new natural-gasoline plant, 16 miles northwest of Durant, is still under construction. This new 8-in. line starts at a point south of Community Natural Gas Co.'s measuring station south of Durant and will connect with the main line which has previously served Bryan County towns. The Cumberland project was started early in August. Approximately 150 men have been engaged on the construction job under the direction of R. Vandercook, Lone Star pipe-line superintendent, and Luther Tolbert, assistant pipe-line superintendent and construction supervisor.

Eight miles of welded 6-in. line have been completed in the vicinity of San Angelo, Tex., linking an air field southwest of that city with the company's transmission system.

Eleven miles of 4-in. from Purcell to Lexington, Tex., will be completed this month.

Several other projects have been completed this summer in the Temple and Georgetown, Tex., districts.

Fullerton Field Connected With Magnolia's Trunk Line

Fullerton Oil Co., discoverer of the Fullerton field in northwestern Andrews County, West Texas, is laying 16 miles of 4½-in. pipe line from its properties to connect with the trunk system of Magnolia Pipe Line Co.

The Fullerton field, which produces from Permian lime pay around 7,000 ft., now contains 7 completed wells and approximately 10 are now drilling. Since discovery of the field, Fullerton production has been delivered to the pipe-line system by truck.

Panhandle and East Ohio Gas Ordered to Connect Pipe Lines

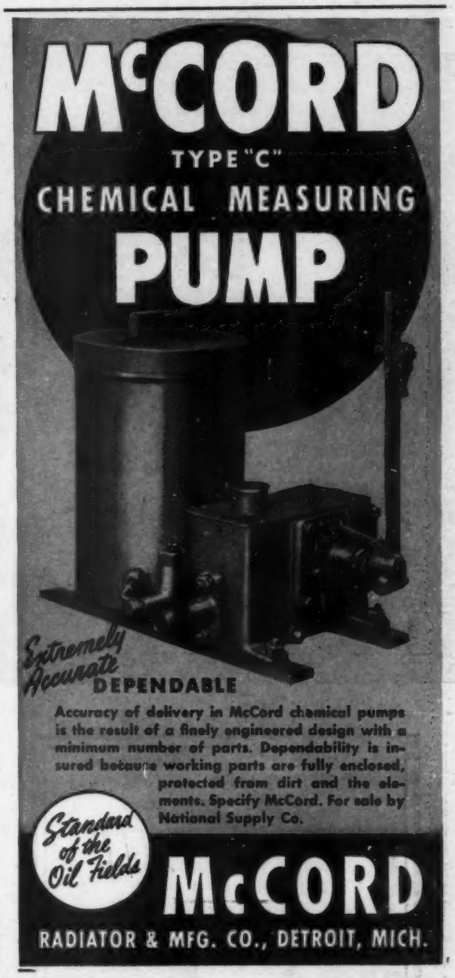
In order to avert a gas shortage next winter in that part of Central Ohio served by the Ohio Fuel Gas Co., the War Production Board has ordered the Panhandle Eastern Pipe Line Co. and the Ohio company to establish an interconnection that will permit the delivery of gas from the Panhandle to the Ohio system.

The pipe lines of the two companies join at the Indiana-Ohio state line between Muncie, Ind., and Dayton, Ohio. An interconnection can be made by simply opening a cutoff valve.

Sinclair Laying Line From Bowie to Montague Field

The deep Marble Falls sand pool in southern Montague County, North Texas, is to soon have another outlet. Sinclair Refining Co., pipe-line division, is constructing 16.9 miles of 4-in. line from the field to the company's Bowie station on the Texas-Oklahoma trunk system.

Four producing wells in the deep field have a base allowable of 1,280 bbl. daily. The 4-in. line now under construction will have capacity of 5,500 bbl. per day.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TYPE "C"
CHEMICAL MEASURING
PUMP
Extremely Accurate
DEPENDABLE
Accuracy of delivery in McCord chemical pumps is the result of a finely engineered design with a minimum number of parts. Dependability is insured because working parts are fully enclosed, protected from dirt and the elements. Specify McCord. For sale by National Supply Co.
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Anywhere!

Buckeye Trenchers minimize right-of-way work. Dig in any soil. Ruggedly constructed. Faster. Readily maneuvered. Model 12 (shown) for gathering, gasoline and small natural gas lines. Models 32 or 48 for main lines. The standard trenchers for pipeline work.

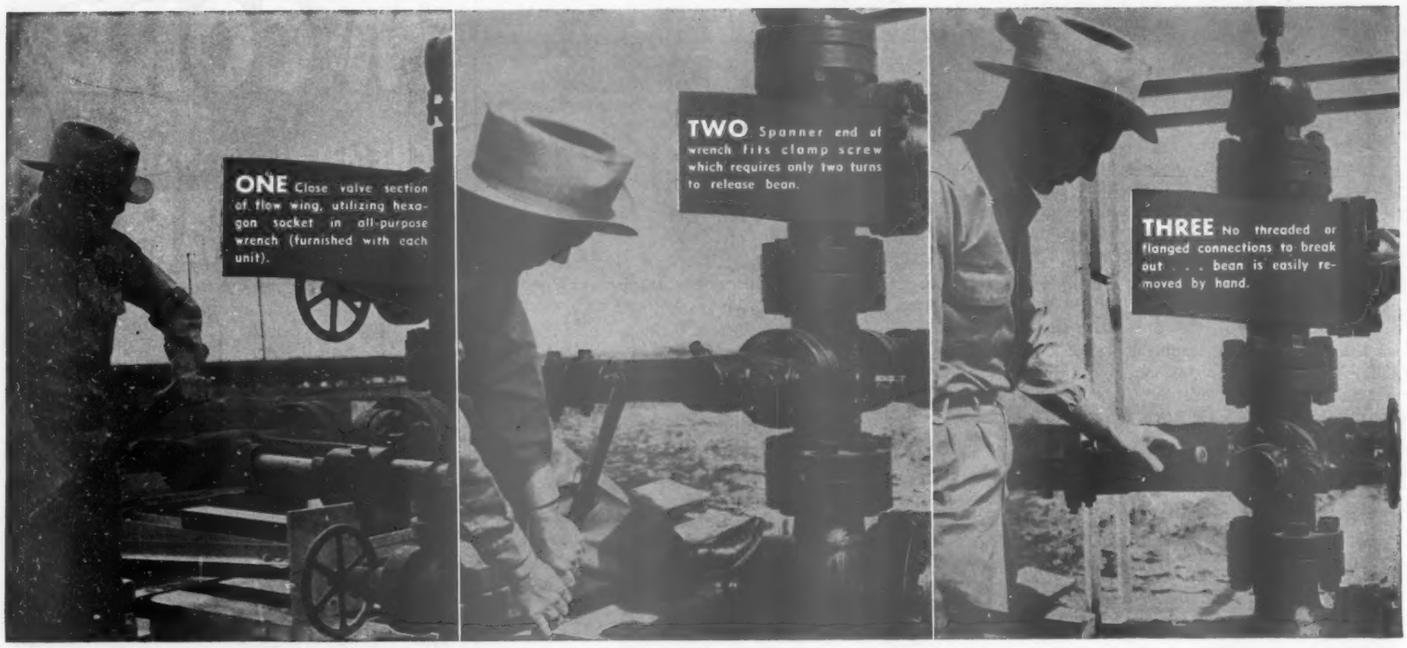
BUCKEYE TRACTION DITCHER COMPANY
Findlay, Ohio
Built by Buckeye
TRENCHERS, SHOVELS, CRANES
BACKFILLERS, TRACTOR EQUIPMENT

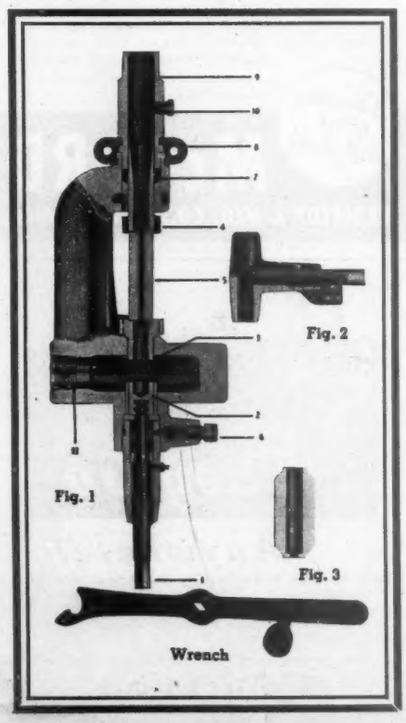
CAMERON FLOW WING

MAKES CHOKE CHANGING SAFER AND QUICKER

Because-

No Vital Xmas Tree Valves to Close;
No Threaded or Flanged Connections to Break Out


ONE Close valve section of flow wing, utilizing hexagon socket in all-purpose wrench (furnished with each unit).
TWO Spanner end of wrench fits clamp screw which requires only two turns to release bean.
THREE No threaded or flanged connections to break out . . . bean is easily removed by hand.



The Cameron Type "D" Flow Wing combines *four Xmas tree fittings in a single compact unit:* (1) A Xmas tree wing valve, (2) a quick-change positive or adjustable choke, (3) a two-bolt flowline union, and (4) a bleeder connection. The valve section of the unit permits a quick and easily operated shut-off while changing chokes *without the necessity of closing any vital valves on the tree.* All parts for the assembly may be readily replaced in the field without removing the unit from the well.

Cameron Flow Wings are made in several screwed and flanged styles ranging up to 10,000 lb. test. Like any standard fitting or valve, they may be incorporated in *any manufacturer's Xmas tree.* Complete mechanical details will gladly be sent to interested operators on request.

HOW IT OPERATES: Referring to Figure 1 at left, to change flow bean fit hexagon socket in wrench to valve stem (1) and close valve (2) against seat (3). Spanner part of wrench is then applied to clamp screw (4), and only two turns required to release flow bean (5). New bean is clamped in place by clamp screw and valve is then opened and well is back on production. Both valve stem and valve seat are faced with hard metal to resist cutting. Valve stem and bonnet are packed with plastic packing which may be replenished under pressure. Clamp screw is packed with an asbestos ring (7) which is tightened automatically as flow bean is clamped in place. Two-bolt union (8) obviates need for additional union in flow line. Note that downstream end of clamp screw is belled to reduce turbulence and cutting. Three types of flow beans are interchangeable: (1) "proration" bean illustrated in flow wing; (2) adjustable flow bean, Figure 2; and (3) "production" type bean which consists of a body and renewable stellite orifice disc. All flow beans clamp in position as shown in Figure 1.

Cameron—first in the oil tool industry to earn the Navy "E"—now proudly flies the All-Navy "E" Burgee with White Star added, emblematic of continued excellence in production of Naval Ordnance.

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

With the formation of the section of Reclamation of Oil-Field Facilities, OPC shows signs of entering more deeply into local problems concerning production and the abandonment of wells. Several interesting possibilities, each loaded with dynamite, present themselves. For example, production in certain fields is so small that it can be considered virtually zero. Casing, pull rods, sucker rods, central powers and other equipment held by leases in these fields could be transferred to other stripper areas and more oil could be produced with the same equipment. Unfortunately, the same owners would not be involved, so that the program would involve enforced transfer, or confiscation of the property of some operators. The problem of recompense of these operators would then arise and this would be complicated by the fact that natural forces operating during a shutdown period of some years might cause concentration of the oil in certain portions of the field and redrilling might prove successful. Who would own the leases?

It has been suggested that some wells in East Texas could be pulled and the equipment used elsewhere. The present system of allocating production in that field is on a per-well basis without reference to acreage and permits for each well were granted on this condition. There are leases in that field drilled on a half or even a quarter-acre basis. If three out of four wells on a single 1-acre lease are pulled, would the operator be entitled to an allowable of 80 bbl.? It would seem quite possible that this would commence agitation for allocation of production on a basis involving acreage in East Texas which would compel the Texas Railroad Commission to reverse a position held for a decade.

Operators not immediately concerned with cases such as the above might be heartily in accord with regulation by OPC on the basis of true conservation. It is easy to see the advantages gained by regulating the other fellow. It might be even more pertinent, however, to suggest that if legislation in the past had been drawn up to compel unit operation and sound development of oil fields, the section of Reclamation of Oil-Field Facilities would be able to devote its full time to what its title implies.

ILLINOIS: Oil is reported in wildcats in Richland and Wabash counties. No large increase in activity is reported as a result of recent liberalization of M-68 (p. 87).

ARKANSAS: Possible discoveries in Union and Miller counties are near the testing stage (p. 91).

WYOMING: A new pay, the Embar lime, was opened at Pilot Butte after the discovery well was plugged back from the Tensleep. Wertz is extended ¼ mile to the northwest. Twinning of Tensleep producers to get Embar production has begun in the Circle Ridge field (p. 88).

WEST CENTRAL TEXAS: New production has been found in the Flippen sand in Taylor County and there are indications of a new pool northeast of McMillan in Runnels County (p. 89).

CALIFORNIA: War demand may prove the deciding factor in developing two areas in the Los Angeles district where drilling is opposed by landowners. These are the now-famous Gilmore Island "indoor oil field" and the Rancho Sausal district near Playa del Rey. Plans to store gas during the summer in the Playa del Rey field are also being considered. The second well at Buena Park has been completed with higher production than the discovery and the core-drill discovery at Yorba Linda has been confirmed by a pumper (p. 82).

NORTH TEXAS: A new pool has been opened in southern Montague County with three possible conglomerate pays in the Bend series. Several other wildcats in the same county are showing oil. The Ellenburger is showing oil in the Vogtsberger pool in Archer County (p. 89).

EAST TEXAS: Attempts to extend Chapel Hill pool 2 miles to the south have not proved very successful as the lower Pettit showed nothing and a small flow was obtained from upper zone. A low well appears to limit Coke field on the east (p. 89).

WEST TEXAS: New Simpson production has been found between Abell and Sand Hills. New wells at Fullerton indicate that the best production may lie south and east of the early activity (p. 84).

OKLAHOMA: New production is reported northeast of Centerpoint, in Pottawatomie County, where oil dropped off rapidly and the well was completed as a gasser. A shallow pool has been opened in Marshall County southwest of Cumberland and Navina and Brooksville are both extended (p. 79).

TEXAS GULF COAST: Cockfield production at Aldine, Harris County, is extended several hundred feet to the west. Three Wilcox sand wildcats are either testing or are nearing critical depths (p. 82).

SOUTHWEST TEXAS: A Cockfield sand discovery 2 miles northeast of Tesoro, Duval County, and a shallow gas discovery in Starr County are reported (p. 85).

CANADA: A test to the Devonian well up on the Turner Valley structure is planned as a joint operation by several companies. New wells and additional development at Fort Norman are reported although details are lacking (p. 91).

WEST VIRGINIA: Possibilities are good for a new Oriskany sand gas field in Hancock County remote from other production in this pay (p. 86).

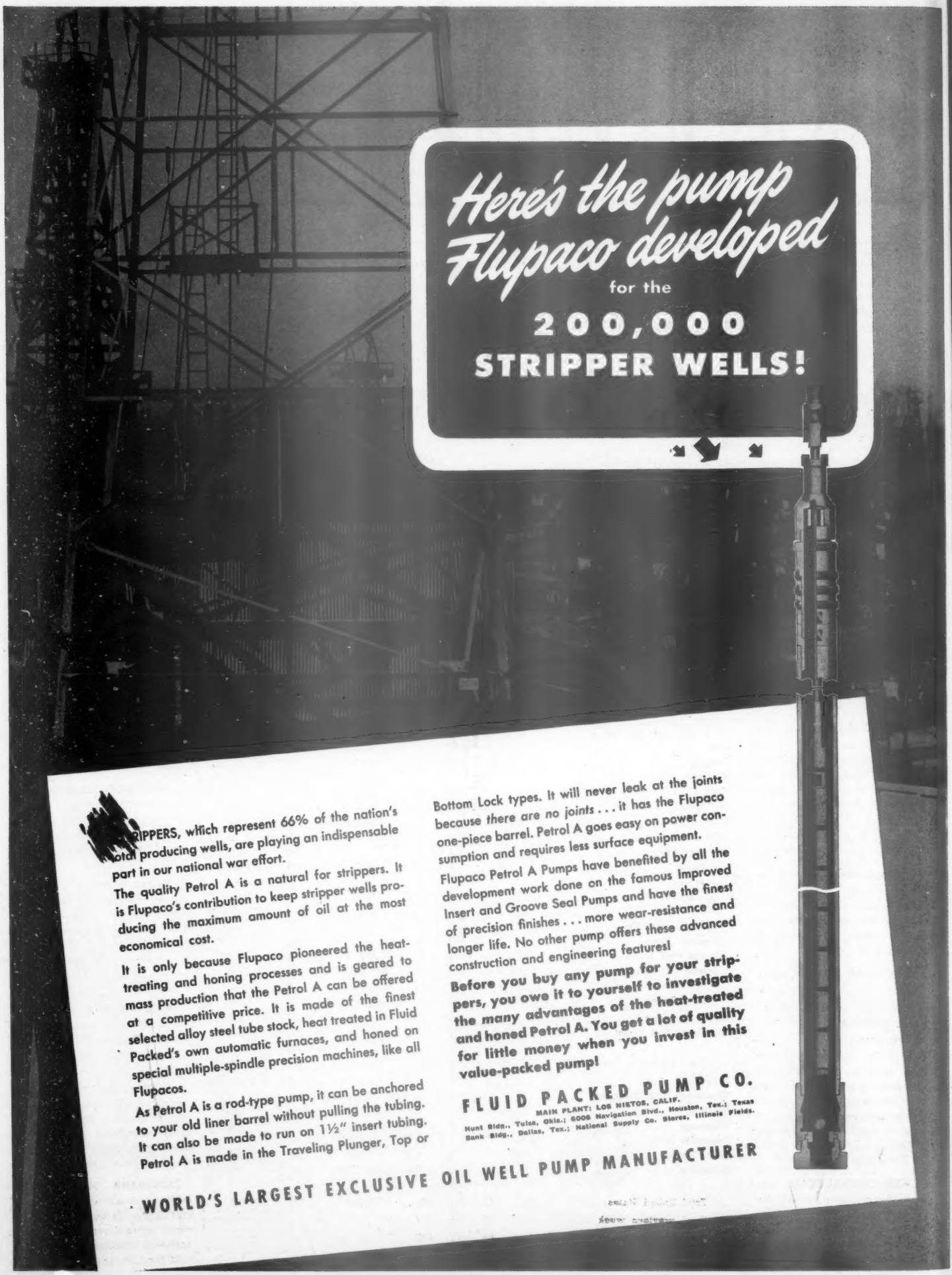
KANSAS: An undrilled area between Lindsborg and a south outpost has been filled by three producers. Chase is linked to Keesling by an Arbuckle producer (p. 79).

LOUISIANA GULF COAST: Drilling was started on four wildcats during the week. Two new sands have been found in a northwest extension well in the old Roanoke field (p. 82).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended September 5, 1942)

	Oil	Gas	Dry	Total	Footage	Tll. comp. to date 1942	Tll. comp. to date 1941
N. Y., Pa., and W. Va.	44	13	3	60	112,083	2,426	4,023
Ohio	3	11	10	24	65,992	753	1,109
Indiana	3	0	3	6	10,581	242	354
Kentucky	1	4	1	6	12,831	203	429
Illinois	21	1	14	36	100,401	1,201	2,354
Michigan	6	3	5	14	35,121	493	589
Kansas	20	1	14	34	120,669	1,091	1,494
Nebraska	0	0	0	0	0	26	64
Missouri, Iowa	0	0	0	0	0	10	25
Oklahoma	12	2	8	22	76,233	839	1,298
Texas:							
North Central Texas	20	1	16	37	122,225	821	1,944
West Texas	18	1	2	21	89,290	1,005	1,502
Texas Panhandle	6	0	0	6	18,432	272	422
Eastern Texas	2	1	5	8	41,111	284	731
Texas Gulf Coast	7	1	4	12	83,079	524	746
Southwest Texas	11	0	5	16	87,933	793	1,250
Total Texas	64	4	32	100	442,070	3,699	6,495
North Louisiana	7	1	6	14	70,239	341	475
Louisiana Gulf Coast	2	1	4	7	54,584	370	604
Total Louisiana	9	2	10	21	124,823	711	1,079
Arkansas	4	0	1	5	25,337	119	127
Mississippi and Southeast	1	0	3	4	24,195	.....	174
Montana	0	1	0	1	2,921	133	188
Wyoming	3	0	0	3	13,986	70	128
Colorado, Utah	0	0	1	1	3,501	12	25
New Mexico	3	0	2	5	16,055	188	201
California	12	0	1	13	40,185	509	766
Total United States	206	42	108	356	1,226,984	12,792	20,922
Total previous week	175	43	106	324			
Week ended Sept. 6, 1941	487	49	171	687			



STRIPPERS, which represent 66% of the nation's total producing wells, are playing an indispensable part in our national war effort.

The quality Petrol A is a natural for strippers. It is Flupaco's contribution to keep stripper wells producing the maximum amount of oil at the most economical cost.

It is only because Flupaco pioneered the heat-treating and honing processes and is geared to mass production that the Petrol A can be offered at a competitive price. It is made of the finest selected alloy steel tube stock, heat treated in Fluid Packed's own automatic furnaces, and honed on special multiple-spindle precision machines, like all Flupacos.

As Petrol A is a rod-type pump, it can be anchored to your old liner barrel without pulling the tubing. It can also be made to run on 1½" insert tubing. Petrol A is made in the Traveling Plunger, Top or Bottom Lock types. It will never leak at the joints because *there are no joints* . . . it has the Flupaco one-piece barrel. Petrol A goes easy on power consumption and requires less surface equipment.

Flupaco Petrol A Pumps have benefited by all the development work done on the famous Improved Insert and Groove Seal Pumps and have the finest of precision finishes . . . more wear-resistance and longer life. No other pump offers these advanced construction and engineering features!

Before you buy any pump for your strippers, you owe it to yourself to investigate the *many* advantages of the heat-treated and honed Petrol A. You get a lot of quality for little money when you invest in this value-packed pump!

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WORLD'S LARGEST EXCLUSIVE OIL WELL PUMP MANUFACTURER

Trenton Play Revives Interest In Western Part of Basin

By HERNDON E. DAVID

THE "Trenton" limestone of Illinois has assumed new importance as the result of a recent oil strike near St. Jacob on the western edge of the eastern interior basin. Perhaps the most significant discovery since the opening of the Devonian lime to production at Salem, the St. Jacob strike opens several hundred square miles to Trenton exploration in Illinois and may even stimulate new development in northeastern Missouri and southeastern Iowa where the Trenton beds lie at a relatively shallow depth.

The Trenton limestone of Illinois consists of the Kimmswick, Plattin and Joachim formations in the southern part of the state and the Galena-Platteville in northern Illinois. The Kimmswick formation in which oil production has been obtained in a few localities of southern Illinois is a light gray, crystalline limestone which has been too tight to permit anything but small production. In the Dupo field, St. Clair County, the Trenton lime is much more permeable and resembles the Viola lime of the Mid-Continent area. The eastward extent of this Viola-type Trenton in Illinois, however, is not known due to lack of exploration of this formation.

"Trenton" Incorrect Name

The term "Trenton" as applied to Ordovician limestones in Illinois is not only incorrectly used, but is derived from a formation name which is, itself, incorrectly applied. The Trenton limestone, of Middle Ordovician age, is a limestone series found in New York and eastern Canada. When oil was found in Ohio in a limestone of practically the same age on the crest of the Cincinnati arch, the older term was applied to it. Later the formations outcropping in the Blue Grass region of Kentucky were broken up into members and it was found that there were a number of limestones which correlated with the Trenton of New York and also with lower formations. There was an unconformity at the top of the group as well as several within the group. The presence of these unconformities permits the development of porosity at several levels within the group with the consequent possibility of multiple pays.

During the first Illinois play following the discovery of oil on the La Salle anticline, the structural similarity of this feature with the Cincinnati arch led to the hope that "Trenton" oil would be found here and the term became applied to the small production found at Martinsville, Kankakee and Westfield. Later the "Trenton" took another jump to Waterloo and Dupo on the western side of the basin.

A review of Trenton development in Illinois appeared in The Oil and Gas Journal, October 30, 1941, Page 164.

The St. Jacob pool was discovered early in May of this year and since that time 10 wells have been completed in the pool. These wells showed for 80 to 120 bbl. daily before acidization with a maximum pay thickness of about 45 ft. in one of the wells. All of the wells have now been acidized and are reported to be potential 500 to 1,000-bbl. producers. None of the wells has been drilled completely through the Trenton and it is possible that other saturated zones will be found deeper in the series.

Top of the Trenton at St. Jacob is found at an average depth of 2,317 ft. and top of the pay zone is encountered at approximately 2,350 ft. At this depth A-frames or portable-mast type of drilling equipment can be used for development and the result is rapid and cheap drilling of the wells. This depth also corresponds to the depths of the more prolific sands in the deeper part of the Illinois basin and, while the Trenton does not have the large initial flows or quick pay-offs of these sands, it can be expected to provide a steady and comparatively long-lived production with an eventual return even more attractive than the shorter lived pays. The pool, thus, appears to be an exception to the general run of Trenton pools found to date.

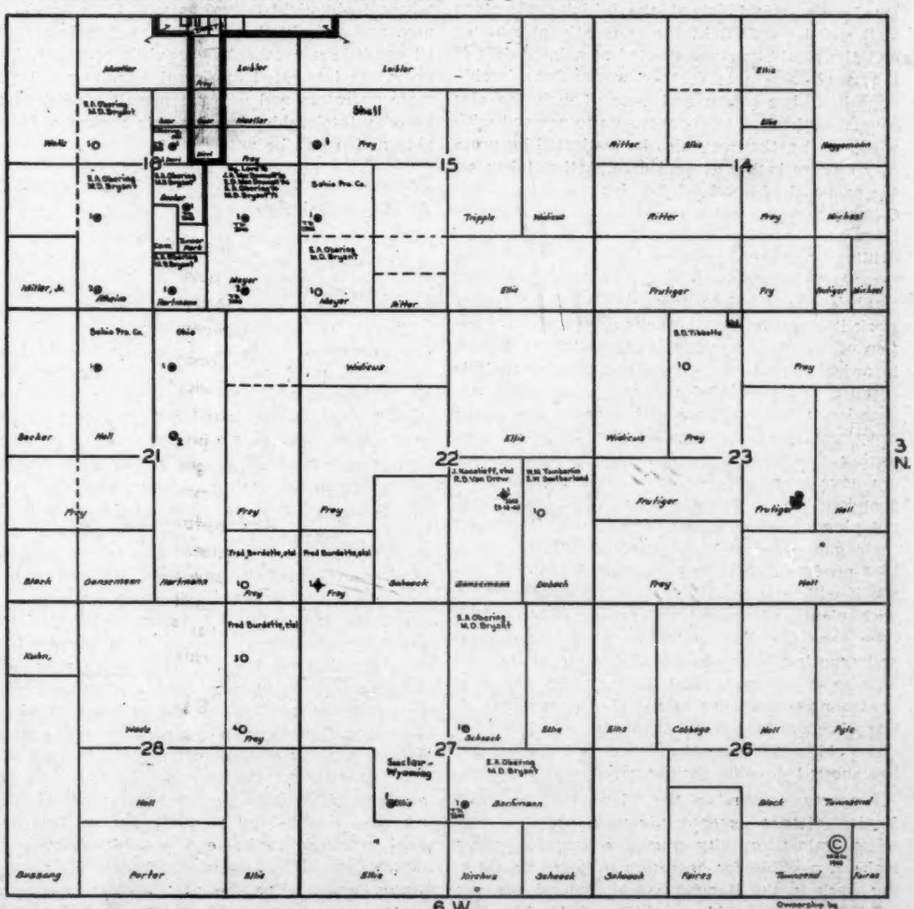
Of the 10 wells completed in the St. Jacob pool, 4 are located in the SE quarter of Section 16 and 4 others are located as 40-acre offsets to these wells. One producing well has been completed in SW NW SE of Section 27, approximately 1¾ miles southeast of the other producing wells in the field. This well may indicate a separate field, however, since a dry hole has been completed about midway between it and the other producers. While development is not far enough advanced to estimate the productive acreage of the field, these completions indicate a minimum productive area of 1,000 acres.

Drilling to date in the field indicates a north-south trending fold with a dome just south of the town of St. Jacob. The discovery well was located as near as possible to the indicated top of this dome and is also located on an M-68 basis. All of the wells drilled in the field to date and the locations staked have also been on 40-acre spacing so as to take full advantage of spacing within any single block.

Since the discovery at St. Jacob, Trenton exploration on the western side of Illinois has increased to its highest peak since 1937. Although Madison County has received most of the development, a recent strike in St. Clair County is at present attracting more interest than other developments on this side of the state. This strike, Big Chief Drilling 1 Halliday, SE NE NW 31-2n-7w, cored streaked saturation in the Trenton similar to cores from the same formation in the St. Jacob pool, 14 miles to the northeast. Even though this well does not make a commercial producer, it is believed to have strengthened the prediction that several additional Trenton oil fields will be found along the western rim of the eastern interior basin.

Numerous Dry Trenton Tests

Many dry Trenton tests have been drilled on the western side of Illinois in recent years but the majority of these were drilled on hunches and surface geology rather than results gained through subsurface exploration. However, there are numerous gaps between these wells in which might lie undiscovered structures offering enough closure to afford commercial Trenton production. The results obtained at St. Jacob indicate what is possible by use of seismic checking aided by surface geology and will lead to a more aggressive and scientific exploration for the Trenton with the probable discovery of many new fields on the western side of the state and also in the northern part. At present the Trenton appears to be the best and most accessible source of oil on the western side of the eastern interior basin. At any rate, the St. Jacob discovery has opened the way to development of one of Illinois' previously untouched oil reserves and offers a new source of crude supply to help check the state's declining production.



Map of St. Jacob field, Madison County, Illinois

CALIFORNIA FIELD REPORT

"Indoor Oil Field" One Step Nearer Start

By L. P. STOCKMAN

LOS ANGELES, Calif. — Consideration of Shell Oil Co., Inc., and J. E. Elliott's proposal to undertake development work in the so-called Gilmore Island area of Los Angeles city, the proposal of several major companies to drill a wildcat in the Rancho Sausal district of Los Angeles Basin and the state-sponsored proposal to store natural gas during the summer in the Playa Del Rey field featured developments in California during the past week. The Gilmore Island project has been approved by the city planning commission and now goes to the Los Angeles City Council with a "do pass" recommendation. The city council postponed action a few days ago and set the hearing for next week at which time definite action will probably be taken. This proposal, which contemplates development of the Miocene in the Gilmore Island area by directional drilling and with actual drilling operations confined within a soundproof structure, is complicated by the fact that the Metropolitan Life Insurance Co. is erecting an extensive housing project in close proximity to the site of the undertaking. The area at the present time is an island of county territory entirely surrounded by city property and therefore the first move will be to incorporate this island into the city after which the city council will have jurisdiction over the property. Due to the cost involved, the initial exploratory well will be drilled in the conventional manner and the steel structure erected at a later date if the result warrants further work. Considerable opposition has arisen and even though the city council authorizes the proponents to proceed with work, civil action may also be instituted by property owners in the general area. Action taken on the proposal of Shell Oil Co., Inc., to drill in the Gilmore Island area may establish a precedent as there are several other sections of the city where drilling might be justified but which has been prevented by adverse council action in the past. If Shell is allowed to proceed with development work it might be well to make a careful examination of all wells previously drilled in the district in order to protect itself against damage as it is recalled that some of the old wells were not abandoned in accordance with present established practice. It will be recalled that several times during the past 10 years, nearby property owners have been obliged to relieve pressure from abandoned wells in their back yards which were not plugged with cement. These wells developed their gas pressure from the old Pliocene zone that produced for many years and for this reason it will be necessary to case the Pliocene zone with plenty of cement to prevent possible Miocene zone gas from entering the Pliocene sand and erupting from some inadequately abandoned hole some distance away. Robert Pence, now a lieutenant commander in the U. S. Navy, has always been apprehensive about the way in which these old wells were abandoned and accordingly has spotted possible danger zones.

Property owners in the Playa Del Rey and Venice district entered vigorous protests this week against any city council action that might make it possible for operators to begin prospecting work in the Rancho Sausal Redondo district located near the Playa Del Rey field. The city council of Los Angeles tabled the request for permission to begin exploration work for another 30 days at which time hearings will begin on the matter. This proposal is somewhat different from the Gilmore Island project in that there are no residences close by and the area is quite large. Standard Oil Co., Union Oil Co., Shell Oil Co., Inc., Texas Co., Tide Water Associated Oil Co., and Richfield Oil Corp. purchased the Rancho Sausal Redondo block in 1937 for a consideration of $900,000. No single company was willing to spend this amount of money for fee title to property that is still considered wildcat territory. Accordingly, the above-named companies purchased fee title to the 1,300 acres involved and have allowed it to remain dormant since that time as there has been no need to proceed with work on fee-owned property. In view of the war demand, however, the companies decided it would prove advantageous to go ahead with development work and determine whether production could be secured. This acreage is generally regarded as having excellent prospects of showing commercial production. The Rancho Sausal Redondo is located west of Sepulveda Boulevard and about 1 mile northwest of the El Segundo oil field and southeast of Playa Del Rey. The protests against the granting of this permit is based on the deplorable conditions that prevailed in the Playa Del Rey field where fly-by-night operators took their profits, if any, and permitted properties to deteriorate until conditions constituted a public nuisance. The operators interested in Sausal Rancho are legitimate operators and will not permit conditions to become intolerable and for this reason a favorable action can be anticipated.

Propose Storing Gas At Playa Del Rey

The state-sponsored proposal to store excess gas during the summer season in the Playa Del Rey field and withdraw it during the winter season to meet peak demands should meet with general approval. The only drawback to the proposal is the numerous diversified interests involved although there is some question as to the possibility of recovering the gas injected unless all sections of the field are produced. Crude-oil production would undoubtedly be increased over a period of time but the gas might have to be treated to remove sulfur if this becomes associated with the gas before it is put into transmission facilities for domestic use. This is considered a technical problem, however, and possible of solution. Governor Olson of California and Richard Sachse, of the state Railroad Commission, recently discussed the matter with Secretary Ickes to determine what action to pursue. It is proposed to have the Defense Plant Corp. condemn or take possession of the entire field and subsequently work out the problem to the satisfaction of all concerned. Unless property owners were unanimously in favor of the matter it might take several years to get the plan working due to the necessity of instituting condemnation proceedings and then establishing property values. This proposal definitely indicates a possible shortage of natural gas in southern California during the winter season. For the past several years the winters have been relatively warm but if another cold period turns up the gas companies will have their hands full meeting peak load. Pipe-line facilities have been increased but it is not always possible to step up production of natural gas.

Second Well at Buena Park

Texas Co. completed its second well in the Buena Park field of Orange County and while this new well showed a larger production than the discovery it does not definitely prove up the field as of major importance. The company's new producer is 4-1-E Buena Park located about 1 mile northwest of the discovery and it showed an initial production of 432 bbl. of 23.2-gravity oil and a small amount of natural gas. Production is coming from the perforated interval at 9,240-9,315 ft. somewhat lower stratigraphically than the discovery well. The productive zone is believed to be the equivalent of the Bell zone of Pliocene age which was first discovered in the Santa Fe Springs field. Several deeper intervals were tested in the new well but as was the case with the discovery well they failed to show commercial production. Texas Co. started two wells subsequent to completion of the discovery, one of these wells being located northwest and the other being drilled to the east. The most easterly well, which was located the highest structurally, found the sand too thin to produce and was abandoned but the present well, the most westerly location, found the zone at a deeper depth but showed a greater thickness of oil sand. The Buena Park structure is believed to be a nose plunging to the west and accordingly 4-1-E Buena Park, the current completion, was located far out on the plunge of the structure. The company's geological department was of the opinion that even though 4-1-E was located lower structurally it might encounter a thickening of the zone. This is just what has happened but it remains to be seen whether additional locations down structure will continue to show greater amount of oil sand.

Yorba Linda Discovery Completed

Shell Oil Co., Inc., confirmed its discovery in the Yorba Linda field of Orange County late this week by completing 77-16 Olinda pumping 138 bbl. of 18.3-gravity oil from 2,040 ft. This well is located on property purchased in fee from Olinda Land Co. several years ago after Shell had determined by means of a core hole that the property would prove productive. Shell paid Olinda Land Co. approximately $500,000 for the 2,000 acres of the tract but suspended developing work after taking title to the property. The core-hole discovery was shut in immediately subsequent to completion and credit for the discovery was held in obeyance pending additional drilling. Completion of 77-16 Olinda this week proved and confirmed the discovery and this will be further verified within another week or so as Shell has 55-16 Olinda on top of the pay and should be ready to make a production test shortly. This field produces a heavy grade of crude oil now in demand to meet requirements for fuel oil. The structure is believed to be a fault trap, a characteristic of this region. The proving up of this area gives Shell two new fields from which to produce heavy oil as a short time ago the company discovered heavy crude oil in the Antelope Plains field in Kern County due west of the southern tip of the North Belridge field.

LOS ANGELES BASIN COMPLETIONS

Buena Park, Orange County: Texas Co. 4-1-E Buena Park, 36-3s-11w, flowed 432 bbl., 23.2-gravity, T.D. 10,044 ft., P.B. 9,325 ft., perf. 9,240-9,315 ft., completed in equivalent of Bell zone of Pliocene age.

Huntington Beach, Orange County: Signal Oil & Gas Co. 42 Bolsa, 33-5s-11w, pumped 242 bbl., 29.3-gravity, T.D. 3,730 ft., perf. 3,240-3,680 ft., completed in Bolsa zone of Pliocene age.

Wilmington, Los Angeles County: Union Pacific Railroad 40-E Edison, 3-5s-13w, flowed 405 bbl., 28.4-gravity, T.D. 4,303 ft., perf. 3,019-4,294 ft., completed in Ranger and upper Terminal zones but only Ranger zone being produced.

Yorba Linda, Orange County: Shell Oil Co., Inc., 77-16 Olinda, 16-3s-9w, pumped 138 bbl., 18.3-gravity,

(Continued on Page 82)

KANSAS, NEBRASKA

Three Lindsborg Wells Close Gap on South Side of Field

By CARL HOOT

COMPLETIONS in Kansas the past week dropped to 35, compared with the previous week's total of 44. Twenty oil wells brought in 6,870 bbl. initial potential. Twenty-nine permits were issued during the week for new work.

The Lindsborg Viola lime pool of McPherson County, which has had alternate spurts of development extending the pool north and south, had three completions during the week which filled the mile-long gap on the south side opened by Dickey Oil 1 Rundberg early in June of this year. All three wells belonged to Carter Oil Co. No. 1 Fornberg, W½ NE SW, made state potential of 415 bbl. a day; 2 Fornberg, W½ SE SW, flowed 275 bbl. a day and 2 Rasmussen, W½ NW SE, flowed 590 bbl. a day. All were in Section 18.

In Rice County, the Chase pool was extended 1 mile southeast by Cities Service 1 McGlyn, SW SE 17-20-9w. Initial potential of 451 bbl. was pumped from Arbuckle at 3,311-18 ft. The well links the Keesling and Chase pools, being approximately equal distance between the two fields.

Other field completions of interest included a Bartlesville sand well in the McLouth pool of Jefferson County. This area has enjoyed a brisk play during the first half of 1942. McLaughlin 1 McLeod, NW NE NW 8-10-20, flowed 17,800,000 cu. ft. of gas, one of the largest gassers in the field, from sand at 1,550-71 ft. Both gas and oil production in this area is predominantly Mississippi lime. The two-zone Ray pool of Phillips County, where production on the north is from Arbuckle lime and on the south from Lamotte sand, received another Arbuckle well when Cities Service 2-D Reese, SW SE NE 29-5-20w, pumped 100 bbl. of oil in 8 hours from 3,612-16 ft. Lamotte sand was found at 3,636 ft., the well was drilled to 3,683 ft. but plugged back to 3,618 ft. It is one of the largest lime wells in the pool.

KANSAS COMPLETIONS

Wildcats

Barton County: Continental 1 Salle, SE NE NW 13-20-13w, dry, T.D. 3,549 ft., Topeka 2,807 ft., Lansing 3,302 ft., Arbuckle 3,522 ft.

Butler County: National Ref. 1 Wolf, SW SW NE 4-27-3, dry, T.D. 3,220 ft., Lansing 1,955 ft., Mississippi lime 2,780-2,940 ft., Simpson sand 3,102 ft., Arbuckle 3,195 ft.

Ellis County, 3 mi. E of Bemis: Lario Oil & Gas 1 Neilsen, W½ NW NW 28-11-16w, dry, T.D. 3,370 ft., Lansing 2,991 ft., base Kansas City 3,235 ft., Arbuckle 3,353 ft.

Harvey County: Atlantic Oil & Investment 1 Williams, SE cor. 30-24-2w, dry, T.D. 4,091 ft., Lansing 2,535 ft., Mississippi lime 3,365-3,795 ft., Hunton 3,837 ft., Viola 3,915 ft., Misener 3,897 ft., Simpson 3,940 ft., Arbuckle 4,033 ft.

Rice County: Lauck & Moncrief 1 Monroe, N½ NE SW 4-18-9w, dry, T.D. 3,275 ft., Lansing 2,886 ft., conglomerate 3,201 ft., Arbuckle 3,255 ft.

Rooks County, 2 mi. SE of Ray pool: Black-Marshall 1 Federal Land Bank, N½ SW NW 11-6-20w, dry, T.D. 3,641 ft., Lansing 3,395 ft., conglomerate sand 3,599 ft., granite 3,640 ft.

Russell County: Phil-Han et al Lipprand, NW NE 11-15-13w, dry, T.D. 3,375 ft., Lansing 3,027 ft., conglomerate 3,298 ft., Arbuckle 3,354 ft.

Sedgwick County: Anderson-Prichard et al 1 Lorg, S½ SW SW 12-27-4w, dry, T.D. 4,318 ft., Lansing 2,855 ft., Mississippi lime 3,703 ft., Viola 4,180 ft., Simpson 4,196 ft., Arbuckle 4,283 ft.

Stafford County: Helmerich & Payne 1 O'Brien, SW cor. 27-25-11w, dry, T.D. 4,367 ft., Lansing 3,513 ft., Mississippi lime 3,955 ft., Viola 4,144 ft., Simpson 4,242 ft., Arbuckle 4,312 ft.

Fields

Bemis, Ellis County: Champlin Ref. 2-K Hadley, E½ NE NW 29-11-17w, pumped 50 bbl., Arbuckle 3,508-17 ft.

Cities Service 1 McGlyn, SW SE 17-20-9w, pumped 451 bbl., Arbuckle 3,311-18 ft.

Dayton, Phillips County: Carter 4 Eltiste, SW NE 35-2-19w, pumped 63 bbl., Lansing 3,152-3,266 ft., T.D. 3,350 ft.

Carter 2 Lizzie Grote, NW NW 1-3-19w, pumped 219 bbl., Lansing 3,168-3,297 ft., T.D. 3,356 ft.

Carter 1 Grote, NE NE 2-3-19w, pumped 66 bbl., Lansing 3,114-69 ft., T.D. 3,304 ft.

Carter 1 Eltiste, NE NE 11-3-19w, pumped 51 bbl., Lansing 3,118-3,296 ft., T.D. 3,308 ft.

Deichman, Cowley County: Arthur Brewer 1 Miller, SE SW SW 13-31-4, dry, T.D. 2,962 ft., Bartlesville 2,833 ft., Mississippi lime 2,932 ft.

Eldorado, Butler County: Cities Service 16 Manning, SW SW 5-26-5, pumped 6 bbl., Arbuckle 2,437-47 ft.

Greenvale, Russell County: Texas 3 Kaufman, S½ SW NW 9-15-12w, pumped 1,063 bbl., Lansing 3,068-87 ft., T.D. 3,314 ft.

Gustason, Russell County: Stanolind 1 Kastrup, N½ NE SE 15-15-12w, pumped 100 bbl., Lansing 2,956-66 ft., T.D. 3,210 ft.

Hugoton gas, Grant County: United Producing 2 Lighty, approximately C 14-30-35w, 7,496,000 cu. ft. gas, pay 2,510-2,700 ft.

Kraft-Prusa, Barton County: Sinclair Prairie 4 Prusa, N½ SW SE 20-16-11w, dry, T.D. 3,583 ft., water disposal.

Pawnee Rock, Pawnee County: Stanolind and Elbar 1 Clemson, S½ SW NE 12-20-16w, dry, T.D. 3,804 ft.

Peace Creek, Reno County: Barnsdall 1 Blasdell, SW NW NW 13-23-10w, swabbed 240 bbl. in 12 hr., Viola 3,749-60 ft.

Cities Service 4 Estey, SE NW 14-23-10w, flowed 142 bbl. in 10 hr., Viola 3,758-67 ft.

Transwestern Oil 3 Ramsey, SW NE SW 36-22-10w, pumped 200 bbl., Viola 3,688-3,718 ft.

Ray, Phillips County: Cities Service 4 Nichol, SW NE SW 33-5-20w, pumped 194 bbl., Lamotte sand 3,552-58 ft., T.D. 3,620 ft.

Schaeffer, Stafford County: Texon 2 Schaeffer, NW SE SW 3-21-13w, dry, T.D. 3,568 ft.

Silica, Barton County: C. E. Ash 2 Roth, N½ SE NE 25-19-11w, swabbed 30 bbl. in 1 hr., Arbuckle 3,321-28 ft.

Trapp, Barton County: Skelly 3 Michaelis, SE SE NE 30-16-13w, dry, T.D. 3,442 ft., Arbuckle 3,417 ft.

Continental 2 Redetzke, SE NW SW 20-16-13w, - 3,000 bbl., Arbuckle 3,381-96 ft.

Anderson-Prichard and Olsen 1 Stoskopf, SE NE NW 29-16-13w, pumped 389 bbl., Arbuckle 3,383-94 ft.

Trapp, Russell County: Champlin Ref. 2-B Tittle, N½ SE SW 14-15-14w, swabbed 75 bbl. in 1½ hr., Arbuckle 3,360-68 ft.

Cities Service 3 Resner, SE SW 23-15-14w, pumped 345 bbl., Arbuckle 3,326-30 ft.

Derby 1-A Dietz, S½ NW NW 22-15-14w, pumped 150 bbl., Arbuckle 3,313-16 ft.

Phil-Han 2 Ochs, S½ SE NE 22-15-14w, swabbed 36 bbl. in 6 hr., Arbuckle 3,277-83 ft.

NEBRASKA-MISSOURI

ST. JOSEPH, Mo.—The Ohio Oil Co.'s Andrew County, Missouri, wildcat test, 1 A. J. Schneider, C SE SE 18-58n-33w, was drilling at 1,700 ft. in the Hunton limestone with no shows as the week closed. Prospects did not look bright. In Atchison County, Missouri, the Cities Service Oil Co. was preparing to set 10-in. surface pipe at 360 ft. at 1 Glenn Gray, SW SW SW 29-65n-39w. Little else was happening in Missouri. William Peppas of St. Joseph and his associates spent another week trying without success to shut off water in 1 Miller, N WC SE SE 8-53n-28w, Ray County, Mo. There was a gas showing in the Bartlesville sand, but the hole was drilled into Mississippi lime and water intruded.

Nebraska likewise had little activity the past week. A mile and a half west of the Falls City pool, S. J. Brown drilled 1 Mable Miles, W½ SW SE 24-1n-15e, to 920 ft. and shut down for orders when the Kansas City lime ran low. Abandonment was expected. In Nemaha County, Nebraska, M. J. Sullivan was drilling 1 William Beason in E½ SE SW 21-6n-13e. This is ½ mile southwest of Brock. The drill had passed the 2,000-ft. mark.

OKLAHOMA FIELD REPORT

Successful Wildcats Reported In Several Sectors

By CARL HOOT

WILDCAT activity was up last week, with new production reported in both northern and southern Oklahoma. It Pottawatomie County, Smith Brothers 1 Dawson, S½ NE NE 6-9-3, 6 miles northeast of Centerpoint, flowed 5,300,000 cu. ft. of gas with 1,700 lb. rock pressure at 5,687 ft. After perforations at 5,540-58 ft. and acid treatment the well swabbed 133 bbl. of oil and 260 bbl. of water. However, oil decreased to 25 bbl. and the well was completed as a gasser.

Approximately 1 mile west of Earlsboro and 2 miles north of Hotulke, Crosbie and Atlantic 1 Turner, NE NW SW 1-9-4, was completed for 77 bbl. of oil a day from Earlsboro sand at 3,849-54 ft. Drilled to 4,574 ft., both the Hunton and Viola lime, producing zones at Hotulke, were found dry and the well was plugged back to 3,905 ft.

In Marshall County, some 6 miles southwest of Cumberland, a new shallow-sand pool was opened by Seitz, Comegys & Seitz 2-B Barrett, NW SE SE 14-6s-6e. On pumping tests it made 24 bbl. of oil a day from sand at 1,815-18 ft., with total depth at 1,822 ft. Section 6s-6e has been a graveyard for a number of shallow tests drilled over the past several years from 630 ft. to 3,590 ft. One of the first wells to report a show of oil in this immediate area was Dundee Petroleum 1 J. W. Little, SW cor. 9-6s-6e, which was started in 1916. The test was drilled to 2,270 ft., and plugged but considerable gas was had at 250 ft. and a show of oil was found in sand at 610 ft. The 2-B Barrett is about ¾ mile southwest of H. F. Potts 1 Godfrey, a deep dry hole that has been plugged back a number of times; the latest to 3,273 ft. where it swabbed 75 bbl. of oil a day.

Completions extending proven areas included Cities Service 2 Faulkner, SW SW NE 11-15-4w, which flowed 173 bbl. of oil a day from Layton sand at 4,995-5,035 ft. It extends the Navina pool of Logan County, ¾ mile southeast. In Pottawatomie County the Brooksville pool was extended ¼ mile north by Atlantic 2 Ewton, SW NW SW 34-9-3. On a 9-hour flow the well made 450 bbl. of oil.

OKLAHOMA COMPLETIONS

Wildcats

Kiowa County, Gotebo district: Beckwith-Hinton 5 Hipp, SW SW NW 4-6-16w, dry, T.D. 659 ft., Hunton 634-59 ft., pumped 25 bbl. oil and 250 bbl. water.

Logan County: Fain-Porter 1 Cessna, SW NW SE 27-15-3w, dry, T.D. 6,401 ft., sand 4,575 ft., Prue 5,803 ft., Hunton 6,015 ft., Viola 6,148 ft., Wilcox 6,279 ft., second Wilcox 6,371 ft.

Marshall County: Seitz, Comegys & Seitz 2-B Barrett, NW SE SE 14-6s-6, pumped 24 bbl., sand 1,815-18 ft., T.D. 1,822 ft.

Pottawatomie County: Smith Bros. 1 Dawson, S½ NE NE 6-9-3, 5,300,000 cu. ft. gas, T.D. 5,687 ft.

Crosbie and Atlantic 1 Turner, NE NW SW 1-9-4, pumped 77 bbl., Earlsboro 3,849-54 ft., T.D. 4,574 ft.

Stanolind 1 Ratcliff, SW NW NE 10-10-3, dry, T.D. 5,742 ft., Hunton 5,389 ft., Viola 5,525 ft., Wilcox 5,640 ft., second Wilcox 5,738 ft.

Tillman County: W. H. Little 1 Dickey, NW cor. 3-5s-15w, dry, T.D. 1,951 ft.

Fields

Boston, Osage County: Devonian Oil 1, NW NW SE 34-22-7, pumped 115 bbl., Hominy sand 3,007-56 ft.

Brooksville, Pottawatomie County: Atlantic 2 Ewton, SW NW SW 34-9-3, flowed 450 bbl. in 9 hr., Hunton 4,768-84 ft., T.D. 5,005 ft.

Cleveland, Pawnee County: Sinclair Prairie 40 Jones, C W½ NW 20-21-8, pumped 65 bbl., Bartlesville 2,264-2,353 ft., T.D. 2,358 ft.

Cumberland, Marshall County: Pure 2 Little-204, SE NE SW 28-5s-7, flowed 2,064 bbl., sand 5,720-5,820 ft., T.D. 5,834 ft.

Cushing, Payne County: Oklahoma Gaso. Plants 1 Howard, SE NE 3-18-6, dry, T.D. 3,346 ft.

Edmond, N.E., Oklahoma County: Harper-Turner 7 Harper, SE SW 17-14-2w, 1,500,000 cu. ft. gas, sand 5,900-28 ft.

Harper-Turner 8 Harper, SE NE 17-14-2w, flowed 45 bbl., Laton sand 5,762-5,800 ft.

Harper-Turner 9 Harper, SW SE 17-14-2w, dry, T.D. 5,900 ft.

Hotulke, Pottawatomie County: Wood Oil 2 Webber, NW SW NW 26-9-4, dry, T.D. 4,566 ft., Hunton 4,188 ft., Viola 4,341 ft.

Loco, W., Stephens County: J. E. Jackson 1 Lowery, NW SE NW 8-3s-5w, flowed 46 bbl., sand 422-1,186 ft., T.D. 1,195 ft.

Navina, Logan County: Cities Service 2 Faulkner, SW SW NE 11-15-4w, flowed 173 bbl., Layton 4,995-5,035 ft., T.D. 5,040 ft.

Osage City, Osage County: Moore Oil 5, N½ SW NW 35-22-8, pumped 128 bbl., Big lime 1,961-2,055 ft.

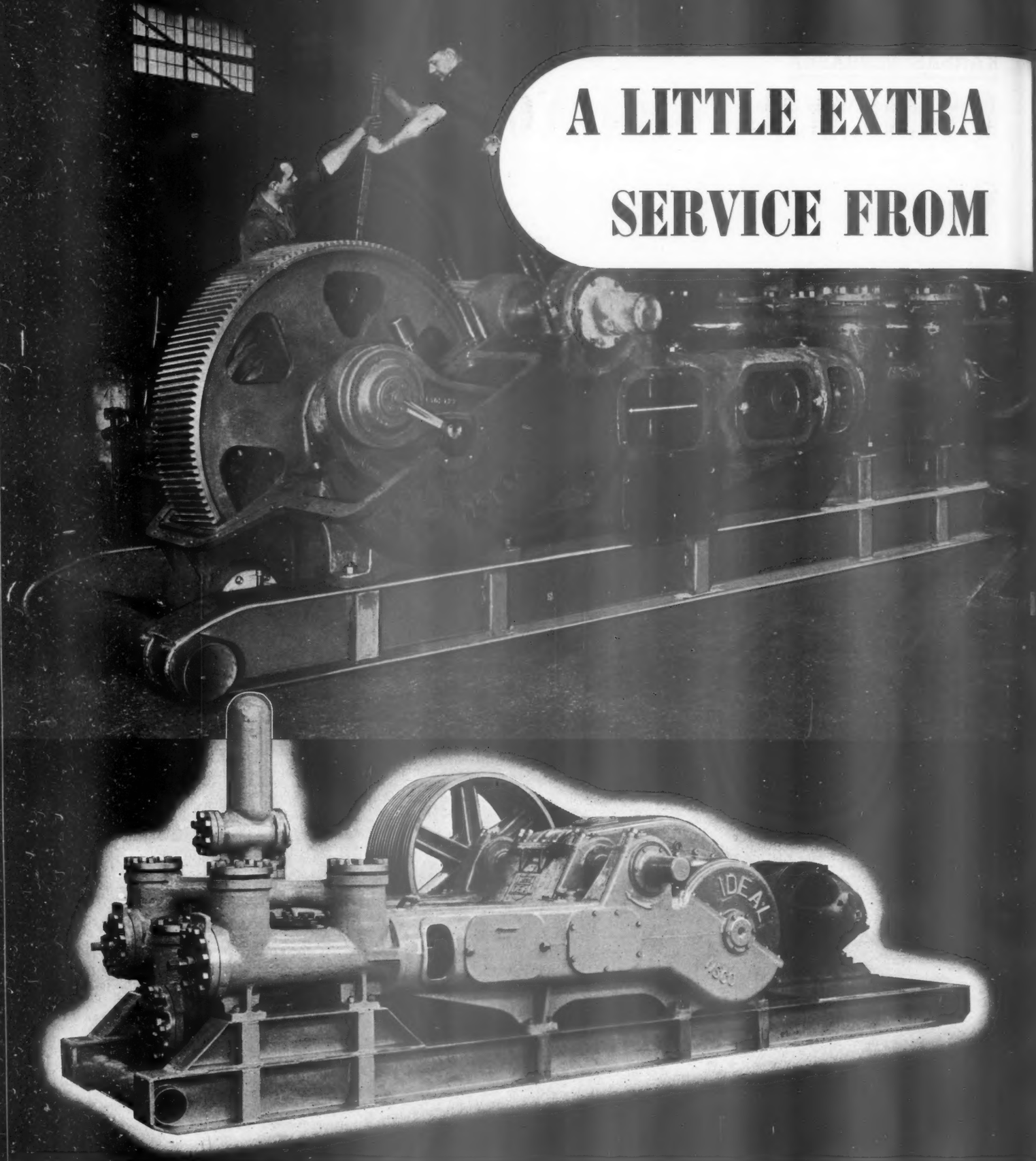
Walters, Cotton County: Red Bed 1-A To-ah-nipper, NE NE SE 14-1s-10w, dry, T.D. 2,235 ft.

Miscellaneous

Creek County: Sooner 3 Ricketts, NW SE NW 16-18-12, pumped 5 bbl., 1,152-84 ft., T.D. 1,192 ft.

Sinclair Prairie 39 Berryhill, SW SW NW 16-17-12, dry, T.D. 1,574 ft.

A LITTLE EXTRA SERVICE FROM



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2. Pumps should be securely anchored on firm, level foundation with special attention given to drive sheave alignment.
3. Keep slush pit adjacent to pump suction pipe free of sand, shale and other debris. Gas-cut mud greatly reduces pump efficiency. Lowest possible suction lift is very desirable to maintain full pump effectiveness.
4. Mud line from pump to stand pipe should be kept as free as possible of short bends to reduce friction and turbulence in the mud stream.
5. Use correct weight and quantity of oil in gear case. Frequency of oil change is dependent on consumption. Oil should be changed at least twice a year however, to remove condensate and other foreign material that might get into the power end of the pump.
6. All bearings should be greased at least once every 24 hours with a good grade of light bearing grease.
7. All Ideal Pumps are equipped with an extra intermediate chamber between the power and fluid end to minimize possibility of drilling fluid entering power end. The fluid end of this chamber is provided with a close fitting cast iron seal around the piston rod. The lock nut at the junction of the piston rod and the intermediate rod is equipped with a steel baffle plate and the power end of this intermediate chamber is equipped with an oil seal on the intermediate rod. These two seals and baffle plate, if kept in good condition, prevent mud entering the power end which obviously would cause rapid crosshead and gear wear.
8. Keep all stuffing box glands evenly adjusted with only sufficient pressure to prevent leakage. Worn bushings should be replaced to preclude extrusion of packing.
9. When changing or replacing liners or liner sleeves, the three liners adjusting set screws in each cylinder head must be backed off, otherwise crimping of new liner may result. Liner sleeves should be changed each time a new liner is installed. Never remove liners by employing power of the pump to push the liner out of the fluid cylinder. Always use a liner puller for this operation to preclude possible costly damage to power end.
10. All strainers on Ideal Pumps should be kept clean at all times to assure free flowages.
11. Fluid valves, inserts and seats should be frequently inspected as valve and seat service can be greatly extended by renewing inserts. Neglect in this respect may permit valve seats to become cut or worn to the point where fluid end of pump may be seriously damaged. Don't fail to check valve cover gaskets to see that they extend 1/16-inch or more beyond grooves in caps.
12. The use of worn pistons in new liners is often a contributing factor to premature liner wear. Priming the pump prior to starting will add greatly to the life of liners and pistons. A tube of lubricant is furnished with each new Ideal piston for application to rubber surface of piston at time of installation to prolong the life of the rubber and to lubricate piston between starting of pump and time of fluid pick-up. Oil or grease should never be used for this purpose as it is extremely injurious to rubber and has no lasting effect.
13. Loose pistons permit washing action between piston rod and piston. Keep piston rod nuts tight to prevent this unnecessary damage. Also check intermediate rod lock nuts for tightness.
14. Pumps should be equipped with dependable relief valve. If shear type valve is used, welding rod or wire should not be substituted for proper size pin as this material seriously affects accurate operation of the valve.

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TEXAS GULF COAST

Aldine Field Extended Several Hundred Feet to West

By F. L. SINGLETON

HOUSTON, Tex.—An extension of several hundred feet west was promised the Aldine field, Harris County, as George W. Strake prepared to test 1 Florence & Parker in the W.C.R.R. Survey 16. With the hole bottomed at 8,005 ft., 5½-in. casing was cemented at 6,645 ft., preparatory to testing the Cockfield sand at 6,595-6,612 ft. The outcome of this test is being watched with much interest in view of the disappointing results of previous tests, resulting from a very faulted structural condition. Of the five wells drilled following the field's discovery, three have been proven productive and all are producing from different horizons in the Cockfield-Yegua formation.

Superior 1 E. G. Frost, a prospective Wilcox sand pool opener about 3 miles northeast of the Lake Creek field, Montgomery County, is being tested for production after drilling to a total depth of 13,293 ft. where a strong flow of hot water was encountered. Drill-stem testing through perforated casing at 13,167-85 ft., recovered mud and wash water with a slight oil show, and another test was being made at 9,900-10,000 ft.

Operators interested in the Wilcox trend were watching the progress of Fain Drilling Co. et al 1 H. O. Baldwin, 3½ miles west of the Mercy field, San Jacinto County. The well is drilling in sandy shale below 7,000 ft., and should log the Wilcox section by the end of the week. The Textularia Warreni was topped at 3,882 ft., Massilina Pratti 4,103 ft., Textularia Hockleyensis 4,254 ft., Textularia Dibollensis 4,749 ft., and the Cockfield at 5,066 ft. Correlated on the Cockfield with the discovery well of the Mercy field, the well is checking about 100 ft. low.

On the extreme south side of the Mercy field, San Jacinto County, Atlantic Refining Co. was still attempting to complete 1 Beshell. Drill-stem testing through perforated casing in the regular 8,200-ft. Wilcox pay recovered oil and salt water, and it can be assumed that the test marks the southern limits of production.

The Harmon field, Jackson County, was defined to the south with the abandonment of Sun 2 J. E. Harmon. Sufficient showings were logged to cement casing for testing, but production tests in the two sands at 5,388-96 ft., and 5,413-19 ft., recovered salt water. The well is located 1,320 ft. due east of the company's 1 Harmon, and about the same distance south of Gulfboard 1-B Harmon. In the meantime, Gulfboard extended production about 1,300 ft. east with the completion of 1-C Harmon, completed in sand at 5,355-5,408 ft.

Stanolind 2 J. E. Thompson, a new sand discovery in the Luckey field, Matagorda County, flowed at the rate of 232 bbl. daily through a ¼-in. choke. Total depth is 9,121 ft., with production from casing perforations in the Frio sand at 8,556-61 ft. The sand is several hundred feet higher than the 8,800-ft. discovery pay which was opened last year by the company's 1 Huebner.

The progress of several wildcats throughout the district were halted by last week's hurricane which levelled many derricks and did considerable damage to drilling equipment. Most of the damage was reported in Matagorda and Jackson counties where the wind was estimated at 100 m.p.h.

TEXAS GULF COAST COMPLETIONS

Fields

Alief, Harris County: Pure 2 Seadous, dry, T.D. 8,633 ft.

College Point, Matagorda County: Pure 1 G. M. and O. Sam V. LeTulle, 762,000 cu. ft. gas, 7/64-in. choke, perf. casing 3,890-3,908 ft., T.D. 4,527 ft.

Esperson, Liberty County: General Crude 41 Moores Bluff, dry, T.D. 6,125 ft.

Ganado, Jackson County: Texas 4 Sillman, 190 bbl., ⅛-in. choke, perf. casing 6,630-33 ft., T.D. 6,635 ft.

Harmon, Jackson County: Gulfboard 1 Harmon, 221 bbl., 7/32-in. choke, perf. casing 5,355-5,408 ft., T.D. 5,457 ft.

Sun 2 Harmon, dry, T.D. 5,438 ft.

Lovells Lake, Jefferson County: General Crude 1 City Investment Co., 323 bbl., ¼-in. choke, perf. casing 8,235-75 ft., T.D. 8,923 ft.

Luckey, Matagorda County: Stanolind 2 J. E. Thompson, 232 bbl., ¼-in. choke, perf. casing 8,556-61 ft., T.D. 9,120 ft.

Mayo, Jackson County: L. Crouch 1 Rodesney, 20 bbl., 7/64-in. choke, perf. casing 5,435-38 ft., T.D. 5,565 ft.

North La Ward, Jackson County: Barnsdall 2 J. A. Graves, 85 bbl., 3/32-in. choke, perf. casing 5,201-05 ft., T.D. 5,220 ft.

Old Ocean, Brazoria County: Harrison & Abercrombie 2-B Mueller, 455 bbl., ¼-in. choke, top sand 10,190 ft., T.D. 10,908 ft.

Withers, Wharton County: Texas 118-C Pierce, dry, T.D. 6,528 ft.

LOUISIANA GULF COAST

Four New Wildcats Started In Coastal Louisiana

By F. L. SINGLETON

NEW ORLEANS, La.—Drilling was started on four new wildcats in coastal Louisiana the past week. These included Union Sulphur Co. 1 H. Hebert, a semiwildcat located in the Big Lake field, Cameron Parish, and the same company's 1 J. P. Gueno, northeast and northwest of the North Crowley and Bosco fields, Acadia Parish. In Vermilion Parish, Humble Oil & Refining Co. was drilling below 4,600 ft. in 1 Louisiana Fur, Inc., 8 miles south of the Schooner Bayou field. Southeast of this field, Union Oil Co. of California spudded 1-C Louisiana Fur, Inc., in Township 16s-2e.

Union Sulphur 1-A Anding, 1,700 ft. northwest of the Roanoke field, Jefferson Davis Parish, flowed 120 bbl. of distillate and 3,180,000 cu. ft. of gas daily through a ¼-in. choke. Tubing pressure was 400 lb. The well topped sand at 8,652 ft. and was completed through perforated casing at 8,654-61 ft. This well extends the field to the northwest and has found two new productive sands for the field.

Gulf 1 Delta Securities Co., a prospective pool opener, 14 miles southwest of New Orleans, St. Charles Parish, is coring ahead in sand below 6,831 ft. Additional showings were logged during the week at 6,537-47 ft. and 6,547-57 ft. No drill-stem test has been made although sand and sandy shale showing oil has been logged at intervals from about 2,200 ft. to the present depth.

Due to a continued drop in bottom-hole pressures of wells on the east flank of the Pine Prairie field, Evangeline Parish, the Conservation Commission has made a reduction in allowable which figures at the rate of 4 bbl. per acre daily cut, and the present allowable of the field is 3,272 bbl. The decline in bottom-hole pressures of wells on the east side is reported to have averaged 2 lb. per day during the past 30 days.

In the Bear area, Beauregard Parish, Humble Oil & Refining Co. is reported to have contributed 360 acres out of it's block of Hayden & Thompson toward the drilling of a 9,000-ft. Wilcox sand test, tentatively located in the northeast corner of 28-6s-92.

In Iberville Parish and located about 1¾ miles northwest of Grosee Tete, Amerada 1 Angeloz, 41-7s-10e, is bottomed at 9,998 ft., and the well is temporarily shut down to cut side-wall cores following the running of an electrical survey. Details as to what was shown by the electrical log were not available.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

Avoyelles Parish: Placid 2 Thompson-Katz, top Wilcox 5,358 ft., dry, T.D. 7,228 ft.

Fields

Big Island, Rapides Parish: Phillips 2 Eota Realty Co., dry, T.D. 7,018 ft.

Edgerly, Calcasieu Parish: Gulf 2 Hunter, dry, T.D. 6,384 ft.

Pine Prairie, Evangeline Parish: Stanolind 2 Octave Ardon, 180 bbl., 5/32-in. choke, perf. casing 8,112-34 ft., T.D. 8,252 ft.

Roanoke, Union Sulphur 1-A Anding, 120 bbl., ⅛-in. choke, perf. casing 8,654-61 ft., T.D. 9,646 ft.

Starks, Calcasieu Parish: W. T. Burton 6 Lutcher Moore, 2,518,000 cu. ft gas, perf. casing 4,614-30 ft., T.D. 5,706 ft.

Ville Platte, Evangeline Parish: Emile Ludeau, dry, T.D. 10,350 ft.

California Fields

(Continued from Page 78)

T.D. 2,040 ft., perf. 1,808-2,039 ft., completed in Yorba Linda zone of probable Pliocene age.

SAN JOAQUIN VALLEY

Developments during the next week or 10 days should determine whether General Petroleum Corp. is going to get a normal completion in the Paloma distillate field of Kern County in its 1 Gallagher. This outpost, located far down on the north flank of the Paloma structure, has reached a depth of 10,948 ft. at which point side-wall samples are being taken and a resistivity test being made. Core recoveries have been subnormal in this well for the past 200 ft. and it may be possible that General Petroleum has some additional thickness of oil sand that has not been logged. The bottom of this well is several hundred feet lower than successful wells of Western Gulf Oil Co. and Ohio Oil Co. nearer the apex of the structure and for this reason General Petroleum 1 Gallagher has been given only an outside chance.

SAN JOAQUIN VALLEY COMPLETIONS

Belridge, South, Kern County: Belridge Oil Co. 87-32-A fee, 32-28s-21e, pumped 30 bbl., 15.5-gravity, T.D. 884 ft., perf. 820-30 ft., completed in upper sand of Pliocene age.

Belridge Oil Co. 25-33-A fee, 33-28s-21e, pumped 92 bbl., 15.4-gravity, T.D. 845 ft., perf. at intervals 415-825 ft., completed in upper zone of Pliocene age.

Belridge Oil Co. 27-33-A fee, 33-28s-21e, pumped 51 bbl., 15.5-gravity, T.D. 846 ft., perf. 616-784 ft., completed in upper zone of Pliocene age.

Belridge Oil Co. 45-33-A fee, 33-28s-21e, pumped 20 bbl., 28.9-gravity, T.D. 827 ft., perf. 361-784 ft., completed in upper zone of Pliocene age, gravity is higher than usual for this zone because of large volume of gas.

E. A. Parkford 4 Belridge, 12-29s-21e, pumped 105 bbl., 13.1-gravity, T.D. 1,105 ft., perf. 944-1,102 ft., completed in recently discovered oil sand of Pliocene age, east of southern tip of South Belridge field.

Kern River, Kern County: Standard Oil Co. 42-9 fee. 9-28s-27e, dry, T.D. 6,211 ft., P.B. 2,597 ft., base of Macoma 2,288 ft., Chanac 5,362 ft., granite 6,199-6,211 ft., no Eocene.

Round Mountain, Kern County: Shell Oil Co., Inc., 21 Caldwell, 7-28s-29e, pumped 160 bbl., 16.1-gravity, T.D. 1,757 ft., perf. 1,718-57 ft., completed in Vedder zone of Miocene age 1,717-57 ft.

COASTAL DISTRICT

Barnsdall Oil Co. is proceeding with development work in the Newhall Potrero field and one well should close the gap now existing between 1 Ferguson of C. G. Willis and associates and Barnsdall's present production. This interval is slightly less than 1 mile and it appears certain that all of this acreage will ultimately be found productive. Texas Co.'s wildcat northwest of present production in the Newhall Potrero field does not look very promising as it is showing steep dips at 7,345 ft. and shows a gray sand and shale in the bottom of the hole. This well was drilled on the possibility the Newhall Potrero field might extend further to the northwest than appeared on the surface. Union Oil Co. has finally stepped into the Newhall-Castaic region and will drill a test on property leased from the Newhall Land & Farming Co. in 20-4n-17w. This location would place the well about 2 miles due west of the wildcat of Texas Co. now down 7,345 ft.

COASTAL DISTRICT COMPLETIONS

Santa Maria Valley, Santa Barbara County: Union Oil Co. 2-4 Bradley Lands, 36-10n-34w, pumped 258 bbl., 16.1-gravity, T.D. 5,250 ft., P.B. 5,208 ft., perf. 4,737-5,208 ft., completed in Monterey oil sand of Miocene age.

Temescal, Ventura County: Pacific Western Oil Corp. 13 Temescal, 4-4n-18w, pumped 164 bbl., 19.8-gravity, T.D. 3,104 ft., perf. 2,565-3,099 ft., completed in Temescal oil zone of Miocene age.

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PERMIAN BASIN, PANHANDLE

New Simpson Pool Opened Between Abell and Sand Hills

By ROBERT INGRAM

MIDLAND, Tex.—A new Simpson sand pool was opened in southwestern Crane County, halfway between the Ellenburger portion of the Sand Hills pool and the Abell Simpson sand pool of northern Pecos County, by Magnolia Petroleum Co. 1 D. K. Glenn, Section 20, Block 1, H.&T.C. Survey. The well, after running unusually low on top of the Simpson, was showing for a producer the previous week.

Casing was run at that time, and over the week end it was swabbed and flowed for 24 hours, then was shut in for 9 hours. At the end of the period, the discovery was opened to flow through ½-in. tubing choke on 2-in. tubing. It flowed 114 bbl. of oil in 3½ hours, all of which was new oil, then died. Gas-oil ratio tested 442:1. Flowing pressure on casing dropped from 360 lb. to 200 lb. while flowing pressure on the tubing dropped from 300 lb. to zero.

The flow started out at 55 bbl. the first hour, 30 bbl. the second hour, 22 bbl. the third hour and 7 bbl. the last half hour. The well was then shut in to build up pressure.

A week's end, a potential test was started. The well had been shut in again for a period after flowing 287 bbl. of oil in 24 hours through ¼-in. choke on 2-in. tubing, and pressure had built up when opened for the potential from 600 lb. on casing to 1,200 lb., and from 100 lb. on tubing to 535 lb. Official gage was not immediately announced.

Production was coming from the McKee horizon of the Simpson section, which is the chief producing horizon of the Abell area. Except for one well, the Sand Hills production to the north, however, is from the Ellenburger. The lone exception is Continental Oil Co. 1 Jones, 1¼ miles south of Ellenburger production in the pool. The Continental well had tested the Ellenburger but failed in that zone at 6,146 ft. and was plugged back to 6,018 ft. for completion in the Simpson, rating a potential of 83 bbl. a day.

With the upper Simpson believed missing and the Tulip Creek and McKee sand tops indefinite in the Continental well, correlation with Magnolia 1 Glenn is difficult. The pay in 1 Glenn however, appears to be around 600 ft. lower than that in the nearest Abell wells to the south, and this leads to the belief that it is on a separate Ordovician structure which is one of a chain in the area. It was drilled to 6,186 ft., and 7-in. casing was cemented at 6,113 ft.

Humble Oil & Refining Co. staked its first Abell field operation 1 T. R. Parker et al, 660 ft. out of the north corner of Section 6, Block 3, H.&T.C. Survey, south edge of the field.

SOUTHERN WEST TEXAS COMPLETIONS

Wildcats

Coke County: Fain-McGaha 1 E. C. Nicholas, NW 3E Sec. 337, Blk. 1-A, H.&T.C. Sur., elev. 2,065 ft., dry, T.D. 3,830 ft.

Fields

Apco, Pecos County: Anderson-Prichard 4 Boren, Sec. 4, Blk. 605, L. Merchant Sur., N offset to 1 Boren, elev. 2,467 ft., flowed 183 bbl. natural through ⅞-in. tubing choke, Ellenburger 4,689 ft., pay 4,714 ft., T.D. 4,780 ft., P.B. 4,762 ft.

Dune, Crane County: Magnolia 1-21 University, NE SE Sec. 21, Blk. 30, University Sur., ¾-mi. S extension, elev. 2,627 ft., pumped 55 bbl. after shot, anhydrite 1,170 ft., Yates 2,170 ft., lime 2,990 ft., pay 3,105 ft., T.D. 3,205 ft., P.B. 3,164 ft.

Henderson, Winkler County: Atlantic 9-C Hess, SW NE Sec. 4, Blk. 26, P.S.L. Sur., elev. 2,871 ft., flowed 317 bbl. natural through ⅞-in. tubing choke, pay 3,030 ft., T.D. 3,080 ft., P.B. 3,067 ft.

McCamey, Upton County: T. P. Coal & Oil 51-A Lane. SW NE Sec. 5, G.L.C.&S.F. Sur., elev. 2,603 ft., pumped 221 bbl. after acid, pay 2,023 ft., T.D. 2,084 ft.

Noelke, Crockett County: Bolas Chico Oil 2 Bouscaren, SW SW Sec. 29, Blk. GG, gaged 150,000,000 cu. ft. gas through casing, pay 1,171 ft., T.D. 1,212 ft.

Sand Hills Permian, Crane County: Magnolia 16 P. J. Lea, SE NW Sec. 9, Blk. 32, P.S.L. Sur., elev. 2,607 ft., flowed 314 bbl. natural through ½-in. tubing choke, pay 4,330 ft., T.D. 4,508 ft.

Shipley, Ward County: Snowden & Freedman 7-A Wristen, 1,670 ft. from NW line and 2,325 ft. from NE line Sec. 18, Blk. 5, H.&T.C. Sur., pumped 187 bbl. natural, pay 2,466 ft., T.D. 2,602 ft.

Snowden & Freedman 8-A Wristen, 1,661 ft. from SW line and 2,331 ft. from SE line Sec. 18, Blk. 5, H.&T.C. Sur., elev. 2,506 ft., flowed 232 bbl. natural through ¼-in. tubing choke, pay 2,404 ft., T.D. 2,491 ft.

Snowden & Freedman 10-A Wristen, 996 ft. from NE line and 2,330 ft. from SE line Sec. 18, Blk. 5, H.&T.C. Sur., elev. 2,497 ft., pumped 220 bbl. natural, pay 2,400 ft., T.D. 2,548 ft.

Waddell, Crane County: Gulf 55 Waddell, NW SE Sec. 10, Blk. B-25, P.S.L. Sur., elev. 2,766 ft., flowed 8,309 bbl. oil plus 4 per cent sulfur water through

(Continued on Page 90)

New Wells in Fullerton Show Best Production to East

Completion of two new wells in the Fullerton deep pool of northwest Andrews County gave indication, from the size of the flow in each, that best pay might be expected in the direction of these wells, one on the south and the other on the east. Small producers have been brought in on the west side of the area, but the two new wells indicated the possibilities of flush production.

One, Fullerton Oil Co. 1-A Wilson, Section 16, Block A-32, P.S.L. Survey, ¼ mile south extension, was completed for 974 bbl. of 42.5-gravity oil daily, while the other, Fullerton 5 Wilson, Section 15, Block A-32, ¼-mile east extension, flowed 929 bbl. of 43-gravity oil.

Meantime, Fullerton 1-B Wilson, Section 20, Block A-37, on the southwest edge of the area, drilled on past the usual pay section, which swabbed 4 bbl. an hour after acid treatment, and was seeking a second pay for the field. The usual pay was topped at 6,974 ft., and test was taken, at that depth with 2-in. tubing set on bottom and packer at 6,680 ft. At week's end the No. 1-B was drilling in lime at 7,128 ft.

Pipe-line outlet for the area was assured when the Fullerton Oil Co., a Los Angeles, Calif., firm which opened the pool early in the year, asked bids for the construction of a 16-mile, 4½-in. line. The carrier will connect to the seven wells in the pool and run to the Magnolia Pipe Line Co. line at a point near the town of Andrews. At present the oil is being delivered to Magnolia by truck.

Embar Outpost Probable

Possibility of a test of the Ellenburger 3 miles northeast of the Embar Ellenburger pool underlying the West Andrews Permian pool in southwestern Andrews County was seen in the size of casing cemented at Mid-Continent Petroleum Corp. 1 University-South, Section 16, Block 10, University Survey. Operator set 8⅝-in. casing at 4,385 ft. with 500 sacks, indicating that the hole will be taken on to the Ordovician should it fail to show for a well in the Permian lime. The lime was topped at 4,245 ft., and hole carried to 4,410 ft.

Similar preparations were made at an inside well in the area, Atlantic 2-A University, NE NW Section 12, Block 11, University, ¼ mile north and a little west of the Atlantic 1-A University. This well is about 1¾ miles northwest of Phillips 4 University-Andrews, nearest Embar Ordovician producer. Here also 8⅝-in. casing was set at 4,183 ft. with 350 sacks of cement. Total depth was 4,380 ft. in lime.

Of the scheduled Ordovician tests, Stanolind 1-W University, SW NE Section 19, Block 11, 1 mile north and slightly west of Phillips 4 University-Andrews, was drilling at 6,870 ft. in lime; Phillips 9 University-Andrews, NW NW

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Section 32, Block 10, ½ mile southeast of the discovery well, was drilling at 5,130 ft.; Phillips 10, NE SE Section 36, Block 11, 1 mile southwest of the discovery well, was drilling at 5,700 ft., and Phillips 12, SE SE Section 24, Block 11, 1¼ miles northwest of the discovery, was drilling at 7,170 ft., and Phillips 13, SE SE Section 13, Block 11, 2¼ miles northwest of the discovery, was trying to free stuck drill pipe with total depth 5,311 ft.

Gaines County Wildcats

Salty sulfur water was being swabbed from the Texas Co. 1 J. Bay Robertson, Section 25, Block A-21, P.S.L. Survey, southern Gaines County, 2½ miles west of the Kirk area. Swabbed 24 hours, the test returned 8 to 12 bbl. of salty sulfur water an hour with 1,900 ft. of fluid remaining in the hole. Washed with 200 gal. and treated with 1,000 gal., it was being swabbed through 30 perforations in 5½-in. casing at 6,440-50 ft.

Shell Oil Co. 1 D. N. Leaverton, Section 458, Block G. C.C.S.D.&R.G.N.G. Survey, 4 miles southwest of the Wasson pool, was drilling below 4,210 ft. in anhydrite.

NORTHERN WEST TEXAS COMPLETIONS

Wildcats

Martin County: Magnolia 1 E. B. Powell, SW SW Sec. 18, Blk. 35, Twp. 1n, T.&P. Survey, 8 mi.

(Continued on Page 86)

SOUTHWEST TEXAS

New Cockfield Sand Pool Found In Eastern Duval County

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—A new Cockfield sand discovery in eastern Duval County and a shallow gas discovery in Starr County were the highlights of development in the Southwest Texas district the past week.

Two miles northeast of the Tesoro field in Survey 306, Taylor Refining Co. continues to test 1 Cadena which flowed 45 bbl. of 44-gravity oil daily through choke. Total depth is 5,862 ft. and production is through casing perforations at 5,269-75 ft.

A new Cockfield test is slated to be started for this trend as Humble Oil & Refining Co. farmed out to J. C. Poole, 1,292 acres of its 8,000-acre block centering in the La Hurta grant, and a 6,200-ft. test is to be started by September 15. Magnolia Petroleum Co. has contributed $2,500 toward drilling the well, while several other companies have purchased acreage around the well site.

Sun Oil Co. marked up another discovery in Starr County with the completion of 1 Cortez, a wildcat located northwest of the Sam Fordyce field. The well was drilled to a total depth of 4,620 ft. and is now shut in after testing gas through perforated casing at 2,900 ft. Fuel from this well will be used for drilling 1 Solis, ¾ mile northwest of the discovery. This is the fourth discovery to be opened by the company in the county this year.

In Live Oak County, Moore Development Co. was testing 1 Doebbler, 5 miles south of the Simmons townsite, Live Oak County. With the hole bottomed at 2,577 ft., 5½-in. casing was cemented at 2,052 ft. Testing through perforated casing at 1,810-15 ft., tested salt water, while another test at 2,002-03 ft. recovered oil and considerable salt water and tested 400 lb. working pressure. At the end of the week another test was scheduled to be made. The Pettus sand was reported topped at 2,530 ft. and the oil showing is believed to be in the Hockleyensis zone.

Tide Water 1 Gips, located in the Nordheim area, De Witt County, was retested through perforated casing at 7,027-30 ft. and on a 6-hr. test the well flowed at the rate of 66 bbl. of oil and 36 bbl. of salt water daily through choke. Gas volume was estimated at 80,000 cu. ft. This is the shallowest of several sands which have been tested at intervals to 8,400 ft.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Wildcats

Bee County: Rowe & McBride 1 Kroesche, dry, T.D. 4,805 ft.

Jim Wells County: Texas Gulf 1-B Hewitt, dry, T.D. 6,520 ft.

Fields

East Placedo, Victoria County: Stanolind 14 Vandenberg & Hill, 139 bbl., ⅛-in. choke, T.D. 6,875 ft.

Greta, Refugio County: Monday 1 Heard, 58 bbl., ⅛-in. choke, perf. casing 4,397-4,402 ft., T.D. 4,475 ft.

Midway, San Patricio County: F. M. Boykin 2 Community, 215 bbl., 9/64-in. choke, perf. casing 6,076-81 ft., T.D. 6,135 ft.

British American 1 Ray Mullen 111 bbl., ⅛-in. choke, perf. casing 6,078-84 ft., T.D. 6,135 ft.

Seeligson, Kleberg County: Humble 3 King, 156 bbl., ⅛-in. choke, T.D. 6,073 ft.

Sun 7 Miller, 110 bbl., 7/64-in. choke, perf. casing 5,937-40 ft., T.D. 5,970 ft.

South Caesar, Bee County: Continental 1 M. T. Fox, 173 bbl., ⅛-in. choke, perf. casing 6,617-20 ft., T.D. 6,623 ft.

Stratton, Kleberg County: Chicago Corp. 47 Wardner, 65 bbl. distillate open flow, perf. casing 6,361-68 ft., 6,528-50 ft., T.D. 6,598 ft.

Southern Minerals 47 Stratton, 59 bbl., 3/32-in. choke, T.D. 6,698 ft.

Southern Minerals 48 Stratton, 78 bbl., 7/64-in. choke, T.D. 6,695 ft.

LAREDO DISTRICT

Wildcats

Starr County: Otto Woods 1-A Bass, dry, T.D. 1,984 ft.

Fields

Greens Branch, McMullen County: Quintana 2-C South Texas Syndicate, dry, T.D. 6,411 ft.

South Campana, McMullen County: Texas 1 fee, 61 bbl., ⅛-in. choke, T.D. 3,046 ft.

SOUTH CENTRAL TEXAS DISTRICT

Wildcats

Wilson County: L. D. Ornsby 1 Caldwell, dry, T.D. 2,890 ft.

BUCYRUS ERIE
36-L
SPUDDER will pull 4200 pounds of tools from 3000 feet . . .
in 8 minutes
The bull reel is gear driven, free wheeling, with two speeds forward and one reverse. The 13⅛" steel barrel is 44½" long with 45" diameter steel flanges. Located at each end are big, wide brakes—two of them with equalizer — each 42" by 6". Bands are faced with ½" asbestos blocks giving smooth, accurate control. Spooling capacity without divider for 4,900' of 1", 6,900' of ⅞", 9,400 of ¾" wire line. Non-kinking divider reduces capacity approximately 6%. Hoisting capacity to 28,900 lbs. in low gear, 13,300 lbs. in high gear. Average line speed 375 ft. per minute in high gear.
CAPACITY To 28,900 lbs.
BIG TWIN BRAKES
Bucyrus-Erie
SOUTH MILWAUKEE, WISCONSIN

APPALACHIAN FIELDS

Possible Oriskany Sand Pool In Hancock County, W. Va.

PITTSBURGH, Pa.—In West Virginia there are indications of a new Oriskany gas pool as the result of a wildcat in Hancock County. In Kanawha County, there was another Big lime oil well and in Jackson County, two large gas wells from the Oriskany. Pennsylvania completions were few and routine.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Allegheny County, Forward Township: Equitable Gas Co. 3846 Karl Maurer, dry, Salt sand 1,163-1,270 ft., Gantz sand 2,100-23 ft., Elizabeth sand 2,789-96 ft., T.D. 2,815 ft.

Armstrong County, Kiskiminitas Township: Carnegie Natural Gas Co. 2 W. E. Orr, 274,000 cu. ft. gas, Tiona sand 2,999-3,012 ft., gas 2,999-3,004 ft., T.D. 3,028 ft.

Fayette County, German Township: Duquesne Gas Co. 1 James Race, 60,000 cu. ft. gas, Big Injun sand 1,245-1,476 ft., gas 1,404 ft., T.D. 3,419 ft.

Wahler-Powers Oil & Gas Co. 1 Mike Risco, 45,000 cu. ft. gas, Murraysville sand 1,685-1,705 ft., gas 1,687 ft., T.D. 2,412 ft.

On the west flank of the New Cumberland anticline in Clay district, Hancock County, John T. Galey et al topped the Oriskany sand and several feet in that member had a showing of about 200,000 cu. ft. of gas in the test on the Lenora Ramsey farm. The test is located on the Wellsville Quad 3.4 miles south Lat. 40° 15′ and 0.9 miles west 80° 35′ about 1 mile west of Pughtown. The top of the Corniferous chert was tentatively placed at 4,565 ft. and the Oriskany (steel line) 4,768 ft.; surface elevation 1,069 ft. At 4,780 ft. there was no increase in the gas but drilling was harder and possibly the usual zone encountered in the Oriskany on top of a second pay.

This test opens a possible new pool as it is remote from any Oriskany production. In 1937, a test was drilled by the same operator on the Rachel Talbott farm about 3.3 miles north and slightly east of the new well. The Oriskany there proved hard with but one greasy showing. The sand in that test was topped subsea 3,683 ft. compared with the subsea 3,699 ft. in the new one. The nearest Oriskany gas pool is about 17 miles north 20° east and was discovered in 1935 by the same operator.

In Grant district, Ritchie County, Benedum & Trees are drilling at 7,223 ft. in the test on the L. J. Rinehart farm, or 1,389 ft. below the top of the Oriskany sand.

In Peytona district, Boone County, Pond Fork Oil & Gas Co. is drilling at 5,322 ft. in the test on fee land and found the Oriskany sand void of any showing.

WEST VIRGINIA COMPLETIONS

Boone County, Scott district: Owens, Libby-Owens 639 Cassingham Coal Land Co., 120,000 cu. ft. gas, Big lime 1,464 ft., Injun 1,682 ft., Berea 2,152 ft., R.P. 250 lb., T.D. 2,204 ft.

Washington district: Hope Natural Gas Co. 8609 Noah T. Bias, 194,430 cu. ft. gas, Big lime 1,563-1,748 ft., Injun 1,748-1,803 tf., Berea 2,231-61 ft., R.P. Big lime 65 lb., Berea 290 lb., T.D. 2,289 ft.

Clay County, Buffalo district: Pittsburgh & West Virginia Gas Co. 7865 Elk River Coal & Land Co., 169,400 cu. ft. gas, Injun sand, T.D. 2,337 ft.

Gilmer County, Glenville district: Phillip Lemon 1 J. W. Leith, 4 bbl. and 65,000 cu. ft. gas, Maxton sand 1,503-58 ft., oil and gas 1,543-55 ft., T.D. 1,841 ft.

Kanawha County, Poca district: Columbian Carbon Co. 10 Homer C. Jones, 50 bbl., Big lime, T.D. 1,563 ft.

Pleasants County, Jefferson district: Newland Oil & Gas Co. 3 G. T. Newland, 1 bbl., third Salt sand, T.D. 1,142 ft.

Putnam County, Curry district: Cooper Gas Co. 1 Enoch Harper heirs, 119,000 cu. ft. gas after shots, Big lime 1,539-1,706 ft., Injun 1,730-96 ft., Berea 2,224-46 ft., R.P. 400 lb., T.D. 2,253 ft.

Eastern Gas Co. 3 T. C. Easter, 73,000 cu. ft. gas in line, Big lime 1,641-1,799 ft., Injun 1,842-82 ft., Berea 2,339-63 ft., T.D. 2,375 ft.

Summit Gas Co. 5 John S. Burdette, 84,000 cu. ft. gas, Berea, T.D. 2,234 ft.

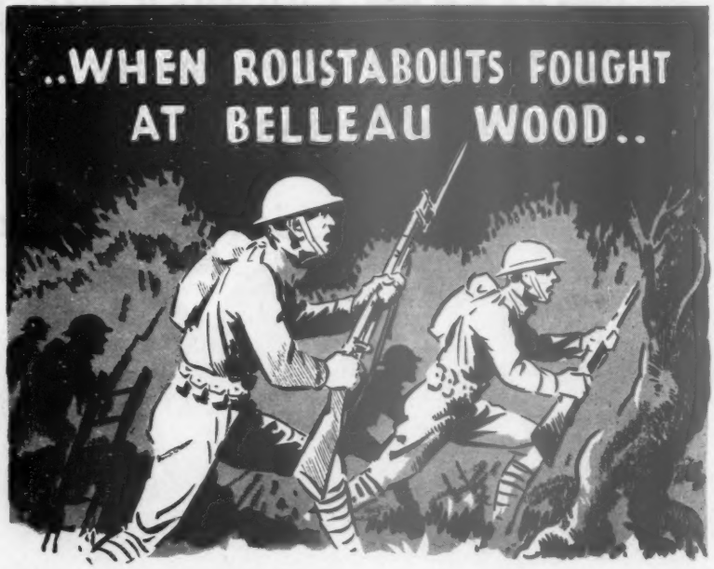
Roane County, Harper district: American Oil Development Co. 1 Romine, Riley & Conley, 5 bbl., Salt sand, T.D. 1,832 ft.

ORISKANY GAS FIELDS

Jackson County, Ravenswood district: Columbian Carbon Co. and Mullins Gas Co. 1 Corda Fisher, 16,070,000 cu. ft. gas, Oriskany 5,269 ft., gas 5,269-83 ft., R.P. 1,535 ft., T.D. 5,283 ft.

Washington district: United Fuel Gas Co. 5112 B. M. Pfost, 17,581,000 cu. ft. gas, Oriskany 5,027 ft., T.D. 5,038 ft.

Godfrey L. Cabot, Inc., 1 A. W. Skeens, dry, Oriskany 5,336 ft., T.D. 5,437 ft.



JoneSuckeRods Had Met All Pumping Conditions For 16 Years

WHEN the "Big Parade" was on, JoneSuckeRods were serving, too. In Pennsylvania, in Ohio, at Corsicana and Spindletop . . . in every field where wells were pumping. During the years that followed, another big parade was on: the parade of a young, robust oil industry across the United States.

New fields, deeper wells, heavier loads, corrosive fluids—JoneSuckeRods were first with the improvements that solved each new pumping problem. Today, with 51 years of leadership in the Sucker Rod Industry, The S. M. Jones Company is serving in the third war of the company's history. With metal so vital to Victory, the quality of JoneSuckeRods is being appreciated now as never before.

The S. M. JONES Co.

JoneSuckeRods

General Office and Factory, Toledo, Ohio — Sales Office, McBirney Bldg., Tulsa, Okla.

Northern West Texas

(Continued from Page 85)

N of Stanton, elev. 2,747 ft., dry, anhydrite 1,550 ft., Yates sand 2,370 ft., first lime 3,510 ft., San Andres 3,800 ft., San Angelo 4,715 ft., Clear Fork 5,790 ft., T.D. 8,313 ft.

Fields

Fullerton: Fullerton Oil 5 Wilson, SE SE Sec. 15, Blk. A-32, P.S.L. Sur., SE offset to 1 Wilson, elev. 3,369 ft., flowed 929 bbl. through 1-in. tubing choke after acid, pay 6,800 ft., T.D. 7,275 ft.

Fullerton Oil 1-A Wilson, NW NE Sec. 16, Blk. A-32, P.S.L. Sur., elev. 3,371 ft., flowed 974 bbl. through 1-in. tubing choke after acid, pay 6,752 ft., T.D. 7,250 ft.

Post, Garza County: M. L. Richards 1 Post estate, NE SE Sec. 6, Blk. 5, K. Aycock Sur., elev. 2,541 ft. pumped 101 bbl. oil and 30 bbl. water after shot pay 2,810 ft., T.D. 2,924 ft.

Slaughter, Cochran County: Magnolia 27 Woodley, NE NE Lab. 9, Lge. 57, Oldham C.S.L. Sur., elev. 3,670 ft., flowed 493 bbl. through 3-in. casing outlet after acid, pay 4,925 ft., T.D. 4,980 ft.

Slaughter, Hockley County: Texas 3 Lucas, 554 ft. from S line and 1,874 ft. from E line of N 872 acres of Sec. 7, Blk. X, P.S.L. Sur., elev. 3,546 ft., flowed 803 bbl. oil plus 2 per cent water through casing after acid, T.D. 5,031 ft.

Wasson, Gaines County: Continental 5-43 Langdon, SE NW Sec. 43, Blk. AX, P.S.L. Sur., elev. 3,537 ft., flowed 1,054 bbl. through tubing after acid, pay 4,936 ft., T.D. 5,000 ft.

Honolulu 1 C. E. Brown, SW SW Sec. 39, Blk. AX, P.S.L. Sur., elev. 3,530 ft., flowed 651 bbl. through ⅛-in. tubing choke after acid, pay 4,890 ft., T.D. 5,006 ft.

Wasson, Yoakum County: Texas Pacific Coal & Oil 86 Bennett, NE NW Sec. 631, J. H. Gibson Sur., elev. 3,582 ft., flowed 590 bbl. through tubing after acid, pay 5,200 ft., T.D. 5,264 ft.

West Andrews, Andrews County: Phillips 16 University-Andrews, SE NE Sec. 14, Blk. 11, University Sur., elev. 3,307 ft., pumped 99 bbl. oil plus 10 bbl. water after acid, pay 4,224 ft., T.D. 4,425 ft.

ILLINOIS FIELD REPORT

Showings Reported in Wabash And Richland County Wildcats

NEITHER the permits for new wells nor actual drilling has had time to show the expected increase due to the 4-month reprieve from 40-acre spacing on sand wells in Illinois, southwestern Indiana, and northeastern Kentucky. This order will permit 10 and 20-acre spacing until the first of the year.

Show of Oil at Richland County Wildcat

Of interest to Illinois oil operators was the E. A. Boles wildcat, 1 Petty, 10-4n-14w, in German township. Upper McClosky tested from 2,965-71 ft. had good porosity and yielded 600 ft. of oil and 780 ft. of water.

In Wabash County, 4 miles northwest of Mount Carmel, Ravenstein 1 Wheatley, E½ NE SE 3-1s-13w, was showing for a possible pool opener. Benoist sand was found at 2,467 ft. and on last report operators were preparing to drill plug for a test. Texas Co. was said to have received saturated core from the Biehl sand. It is the company's 1 William Steckler, located in SE SW 8-1s-12w, about 2 miles north of Mount Carmel.

In St. Clair County Prichard 1 Halliday, 31-2n-7w, was shut down after acidizing, when it failed to produce from streaks of Trenton pay. In Marion County Texas Co. 1 Conant, 25-4n-2e, 2 miles northwest of Alma, found the McClosky dry and was shut down. Nash-Redwins 1 Wilkerson-Wilmore Community, 27-3s-3e, was expected to be completed as an extension to the Aux Vases field opened by the 1 State Game Farm.

ILLINOIS COMPLETIONS

Wildcats

Clay County: Lebow et al 1 Williams, NE SW 1-3n-7e, dry at 3,008 ft., Glen Dean 2,425 ft., Golconda 2,455 ft., Barlow 2,612 ft., Weller 2,710 ft., Paint Creek 2,743 ft., Benoist sand 2,810 ft., Renault 2,850 ft., Aux Vases 2,870 ft., Ste. Genevieve 2,960 ft., Fredonia 2,982 ft.

Kingwood et al 1 J. E. Essen, NW NW SE 20-5n-7e, pumped 64 bbl. oil and 6 bbl. water, 30-qt. shot 2,744-59 ft., Aux Vases 2,833 ft., pay 2,750-60 ft., T.D. 2,929 ft., P.B. 2,759 ft.

Franklin County: Kearus & Shaw 1 McLaughlin, SW SE NW 1-5s-1e, dry at 2,755 ft., Menard 2,011 ft., Glen Dean 2,215 ft., Golconda 2,321 ft., Barlow 2,435 ft., Cypress sand 2,497 ft., Paint Creek 2,600 ft., Benoist 2,657 ft., Renault 2,667 ft., Aux Vases sand 2,740 ft.

Sun 1 Old Ben Coal, SE NE NE 24-5s-1e, dry at 2,779 ft., Glen Dean 2,190 ft., Hardinsburg 2,238 ft., Golconda 2,286 ft., Barlow 2,431 ft., Weller 2,457 ft., Paint Creek 2,556 ft., Bethel 2,614 ft., Renault 2,631 ft., Aux Vases sand 2,698 ft., Ste. Genevieve 2,738 ft.

E. S. Adkins 1-P Old Ben Coal, NW NE SE 35-7s-2e, dry at 2,151 ft., base Pennsylvanian 1,571 ft., Kincaid 1,571 ft., Degonia 1,705 ft., Clore 1,740 ft., Palestine 1,771 ft., Menard 1,925 ft., Waltersburg 1,996 ft., Tar Springs 2,064 ft., Glen Dean 2,149 ft.

Gallatin County: R. L. Kincaid et al 1 Schmitt, NE NE NW 33-7s-10e, dry at 2,946 ft., Palestine 1,883 ft., Tar Springs 2,167 ft., Cypress sand 2,506 ft., Bethel 2,624 ft., Aux Vases 2,732 ft., Ste. Genevieve 2,782 ft., McClosky 2,822 ft., St. Louis 2,938 ft.

Hamilton County: Aetna 1 Giffle-Houson, NW SE NE 33-4s-7e, dry at 3,152 ft., Kincaid 2,336 ft., Menard 2,578 ft., Tar Springs 2,764 ft., Glen Dean 2,798 ft., Hardinsburg 2,852 ft., Golconda 2,936 ft., Barlow 3,065 ft., Weiler 3,140 ft.

Jasper County: F. Jablonski 1 Brown, E½ SW SE 12-5n-9e, dry at 2,980 ft., Glen Dean 2,410 ft., Benoist sand 2,804 ft., McClosky 2,954 ft.

Jefferson County: Wiser 1 Baldridge, S½ SW NE 35-2s-4e, dry at 3,185 ft., Menard 2,200 ft., Waltersburg 2,254 ft., Vienna 2,345 ft., Glen Dean 2,428 ft., Hardinsburg 2,457 ft., Golconda 2,533 ft., Barlow 2,646 ft., Cypress 2,653 ft., Aux Vases 2,939 ft., Ste. Genevieve 3,009 ft., Rosiclare 3,048 ft., Fredonia 3,076 ft., St. Louis 3,178 ft.

Macoupin County: W. R. Holmes 1 Travers, NW SW SE 12-8n-9w, dry at 409 ft.

Montgomery County: W. R. Holmes 1 Klekamp, NW SE SE 29-8n-5w, 600,000 cu. ft. gas, pay 574-78 ft., T.D. 578 ft.

Wayne County: Shell 1 M. Rutger, E½ NE NE 17-1n-7e, pumped 34 bbl. oil and 28 bbl. water, perf. 3,168-94 ft., 1,500 gal. acid, perf. 3,184-94 ft., 1,000 gal. acid, perf. 3,168-78 ft., 1,000 gal. acid, McClosky 3,168 ft., pay 3,170-80 ft., 3,183-91 ft., T.D. 3,239 ft., P.B. 3,180 ft.

Eason Oil 1 Friend, SE SE 11-2s-6e, dry at 3,397 ft., Glen Dean 2,644 ft., Golconda 2,765 ft., Barlow 2,862 ft., Ste. Genevieve 3,206 ft., Fredonia 3,305 ft., McClosky 3,310 ft.

Pure 1-A J. W. Potts, NW SW NW 34-2s-7e, dry at 3,435 ft., Cypress sand 2,925 ft., Aux Vases sand 3,208 ft., Ste. Genevieve 3,274 ft.

Fields

Allendale, Wabash County: W. R. White 1 Cozene, NE SE NW 16-1n-12w, pumped 60 bbl. oil and 40 bbl. water, 40-qt. shot 2,112-22 ft., Benoist 2,111 ft., T.D. 2,124 ft., P.B. 2,122 ft.

Bluford, Jefferson County: Lario Oil & Gas et al 1 Alexander, SE SE NW 1-3s-4e, pumped 576 bbl., perf. 3,072-88 ft., 5,000 gal. acid, reacidized 4,000 gal., McClosky 3,071 ft., T.D. 3,121 ft.

Lario Oil & Gas et al 1-B Alexander, SW NE 1-3s-4e, pumped 476 bbl., 500 gal. acid, reacidized 1,000 gal., McClosky 3,066 ft., T.D. 3,077 ft.

Bone Gap, Edwards County: Tide Water 1 Balding-Ford, NW SW 7-1s-11e, pumped 52 bbl. oil and 40 bbl. water, perf. 3,235-43 ft., 1,000 gal. acid, McClosky 3,235 ft., T.D. 3,245 ft.

Clay City, Clay County: Pure 1-A Baylor, E½ NW NE 10-2n-7e, pumped 69 bbl., 5,000 gal. acid, McClosky 3,047-55 ft., 3,060-64 ft., T.D. 3,095 ft.

Covington, Wayne County: Sohio Prod. 2 Harris, NE SE SW 19-1s-7e, pumped 215 bbl., 5,000 gal. acid, McClosky 3,243 ft., T.D. 3,250 ft.

Dale, Hamilton County: McBride 1 Winters, NW NE SW 5-6s-7e, dry at 3,235 ft., Weiler 2,747 ft., Benoist 2,962 ft., Aux Vases sand 3,053 ft., McClosky 3,192 ft.

A. D. Politis 2 Mayberry, NW NW NE 13-6s-6e, pumped 144 bbl. oil and 5 bbl. water, natural, Aux Vases sand 3,104-17 ft., T.D. 3,122 ft.

Grayville, White County: Skelly 1-B Fearn, SE SE SW 20-3s-14w, pumped 41 bbl. oil and 25 bbl. water, natural, Biehl 1,873-82 ft., T.D. 1,882 ft.

Geff, Wayne County: Pure 1 Atteburg Consol., SE SE 11-1s-7e, pumped 127 bbl., natural, Aux Vases sand 3,083-99 ft., T.D. 3,110 ft.

King, Jefferson County: Lewis Prod. 3 State Game Farm, SE SW 21-3s-3e, dry at 2,928 ft., Glen Dean 2,262 ft., Aux Vases 2,736 ft.

Mason, Effingham County: Tide Water 2 Burke, SE SE SW 27-6n-5e, pumped 160 bbl. oil and 3 bbl. water, 30-qt. shot 2,297-2,309 ft., Benoist 2,289 ft., T.D. 2,309 ft.

New Harmony, White County: Sun 8-A Jacobs, S½ S½ NE 28-4s-14w, pumped 65 bbl., 10-qt. shot 2,587-93 ft., 40-qt. shot 2,587-93 ft., Cypress 2,577 ft., T.D. 2,595 ft.

Sun 2-B Greathouse, SE SE 32-4s-14w, pumped 45 bbl. oil and 40 bbl. water, natural, Benoist sand 2,731-39 ft., 2,745-54 ft., T.D. 2,978 ft., P.B. 2,745 ft.

Noble, Richland County: Pure 27 J. O. Cone, NW SE 4-3n-9e, pumped 189 bbl. oil and 157 bbl. water, perf. 2,588-92 ft., Cypress sand 2,587-2,617 ft., T.D. 2,650 ft., P.B. 2,603 ft.

Sims, Wayne County: Texas 4 Buchal, W½ NE SE 33-1s-6e, pumped 56 bbl., 1,000 gal. acid, 3,000 gal. reacid, McClosky 3,188-3,204 ft., 3,212-20 ft., T.D. 3,224 ft.

Texas 2 Johnson-Lawrence, W½ SE SW 27-1s-6e, pumped 296 bbl. oil and 11 bbl. water, 3,000 gal. acid, perf. 3,116-24 ft., Levias 3,116-22 ft., T.D. 3,202 ft.

Pure 1 C. Finley, SW NE 25-1s-6e, pumped 10 bbl. oil and 16 bbl. water, 35-qt. shot 3,118-33 ft., Aux Vases sand 3,115-27 ft., 3,130-33 ft., T.D. 3,305 ft., P.B. 3,133 ft.

South Lawrence, Lawrence County: Ryan Oil et al 1 Walker, SE NW SW 26-2n-12w, pumped 40 bbl., 40-qt. shot 1,371-81 ft., T.D. 1,995 ft., P.B. 1,382 ft.

South Maunie, White County: McElvain Bros. 2 Poole-Parr, NE NW 13-6s-10e, pumped 185 bbl., natural Aux Vases 2,841 ft., T.D. 2,855 ft.

Woodlawn, Jefferson County: Ruwaldt et al 1 F. A. Chesnick, Jr., SE SE SW 26-2s-1e, pumped 14 bbl. oil and 3 bbl. water, shot 2,014-24 ft., Benoist sand 2,014-24 ft., T.D. 2,024 ft., P.B. 2,022 ft.

OHIO, INDIANA, KENTUCKY

East York Gas Field Extended To Southeast by Big Well

ZANESVILLE, Ohio.—A large gas well in Morgan County extended the East York pool ½ mile to the southeast last week. The Industrial Gas Co. 1 Vernie Divers, NE SW Section 26, York Township, topped the Clinton at 4,327 ft.; drilling was stopped in the sand at 4,341 ft., at which time an open-flow test blew the mercury out of a 15-in. gage. Ten hours later the well gaged 12,000,000 cu. ft., open flow. The East York pool is the southern extension in Morgan County of the Brush Creek field (Gaysport) of Muskingum County.

SOUTHEAST OHIO COMPLETIONS

Ashland County, Vermilion Township: Ohio Fuel 1 Della Aller, Sec. 15, show gas, shot, plugged, Clinton, T.D. 2,789 ft.

Perry Township: Ohio Fuel 2 B. Ryland, Sec. 35, 20,000 cu. ft. gas, plugged, Clinton, T.D. 2,972 ft.

Coshocton County, Tiverton Township: Upham Gas 1 W. Workman, Sec. 13, show oil and gas, Clinton, plugged, T.D. 3,341 ft.

Cuyahoga County, Independence Township: L. F. McGrath 1 I. M. Fisher, Lot 15, 400,000 cu. ft. gas, Newburg, T.D. 2,646 ft.

Holmes County, Richland Township: H. E. Perkins 1 Wm. Heaton, Sec. 5, 60,000 cu. ft. gas, plugged, Clinton, T.D. 3,230 ft.

Washington Township: Ohio Fuel 1 Charles Collier, Sec. 26, 120,000 cu. ft. gas, shot, Clinton, T.D. 2,933 ft.

Ohio Fuel 1 Golda Baum, Sec. 17, dry, Clinton, T.D. 2,974 ft.

Knox County, Butler Township: Ohio Fuel 1 H. G. Hammond, Sec. 3, 210,000 cu. ft. gas, Clinton, T.D. 2,745 ft.

Upham Gas Co. 1 Perry Fry, Sec. 3, 150,000 cu. ft. gas, Clinton sand topped at 2,909 ft., T.D. 2,972 ft.

Union Township: Ohio Fuel Gas Co. 2 H. A. Lower, dry, Clinton sand 2,820-63 ft., T.D. 2,889 ft.

Licking County: Fallsburg Township: Throbert Robison et al 2 Walter E. McDonald, NW Sec. 19, 50,000 cu. ft. gas, Berea, T.D. 750 ft.

Lorain County, Carlisle Township: McMillen 1 John Bendik, Sec. 17, dry, no Clinton sand, T.D. 2,400 ft.

Meigs County, Bedford Township: Ohio Fuel Gas Co. 1 Mildred Douglas, Sec. 4, 6 bbl. and 10,000 cu. ft. gas, first Berea, T.D. 1,721 ft.

Lebanon Township: Proffit et al 1 Taggart, Lot 203, 10,000 cu. ft. gas, shale, T.D. 3,446 ft.

Roy Proffitt et al 2 Taggart, Sec. 28, 20,000 cu. ft. gas, Ohio shales, shot, T.D. 3,446 ft.

Noble County, Seneca Township: J. T. Watson 2 J. J. Groves, Sec. 27, 1,300,000 cu. ft. gas, Mackburg 800 ft. sand, T.D. 750 ft.

Perry County, Clayton Township: Preston Oil 1 Yarger et al, Sec. 5, 115 bbl., shot, Clinton 3,204-36 ft., T.D. 3,260 ft.

Rutland Township: H. M. Nelson 1 N. Entsminger, Sec. 33, dry, Maxon (water), T.D. 715 ft.

Harrison Township: J. L. Swingle et al 1 Paul Hazlett, NW Sec. 9, 150,000 cu. ft. gas, Berea, T.D. 1,215 ft.

Stark County, Pike Township: Natural Gas of W. Va. 1 Clark Cook, Sec. 15, 1,000,000 cu. ft. gas, shot, Clinton, T.D. 4,943 ft.

Summit County, Boston Township: Wm. Dempsey 1 H. E. Robinson, Sec. 3, dry, Newburg, T.D. 3,128 ft.

Richfield Township: Harry Dempsey 1 Melzer & Kimel, Lot 4, show gas, shot, plugged, Clinton, T.D. 3,406 ft.

Washington County, Grand View Township: Consolidated Drilling Co. 1 Noah Ward, NW Sec. 5, 25 bbl. before shot, Injun sand, T.D. 1,525 ft.

Ludlow Township: Russell Hanlon et al 1 A. W. Hood, SW Sec. 9, 250,000 cu. ft. gas and about 2 bbl. oil, Berea, T.D. 2,205 ft.

EASTERN KENTUCKY

ASHLAND, Ky.—Drilling operations showed little change in this part of the state this week and all reports point to the same level in the coming week. A number of wells are nearing the completion point and four gas wells were drilled in this week.

The Kentucky-West Virginia Gas Co. reported the gas-well completions as follows:

Floyd County: 5404 James Hopkins, Left Beaver, T.D. 1,889 ft., Maxon, 520,000 cu. ft. gas.

Knott County: 624 Joseph King, Bates Branch, old well drilled deeper, T.D. 3,093 ft., 729,000 cu. ft. gas from shale, 169,000 cu. ft. gas from Big lime. 5414 Betsey A. E. Slone, Caney Fork, T.D. 2,829 ft., shale, 822,000 cu. ft., shot.

Pike County: 696 J. M. Taylor, Big Branch, T.D. 3,820 ft., brown shale, 223,000 cu. ft. gas, shot.

INDIANA

In Posey County, Calstar Petroleum 1 Perry Scholtz, NE NE SW 12-5s-14w, some 2 miles south of New Harmony, was dry at 3,075 ft. Top of Glen Dean lime was —1,950 ft., total depth of the well was 3,075 ft. No shows were found. In Spencer County the Eureka pool opener was reported to be pumping approximately 100 bbl. of oil a day from McClosky at 1,652-54 ft. after an acid treatment of 1,000 gal. This new pool, opened by J. W. Miller and N. W. Shiarella on the Ruth Locker farm in NW SW NW 34-7s-7w, is 7 miles west of Rockport and 5 miles southeast of Yankeetown. In the same area, W. W. Dameron et al were reported to have spudded in their 1 Hall, NW NW SW 34-7s-7w, offsetting the discovery well to the south ¼ mile. The same operators have made a southeast offset location on W. H. Jones land. Description is NW NE SW 34-7s-7w.

INDIANA COMPLETIONS

Gibson County: C. Clark et al 1 R. Townsley, NW NE NW 2-3s-9w, dry at 1,814 ft., Glen Dean 1,305 ft., McClosky 1,779 ft.

(Continued on Page 88)

ROCKY MOUNTAIN AREA

Embar Lime Added to Pilot Butte Pay Horizons

By T. R. INGRAM

DENVER, Colo.—The second discovery in the Pilot Butte field, Fremont County, Wyoming, this year was chalked up this week in the Superior Oil Co. 1 C. D. Stock, CEL NE NE 21-3n-1w, which is a produced in the Embar sand. After plugging back from the Tensleep at a total depth of 6,750 ft., the 6⅝-in. was gun-perforated in the Embar at 6,150-6,210 ft. and acidized in three stages. It then swabbed 500 bbl. of fluid a day, cutting 30 per cent water. The water mostly is believed to be drilling mud and acidization fluid and is decreasing rapidly in volume. It will be given a pumping test before being listed as a completion. It is located ⅝ mile southwest of 1 Tribal, a joint operation with the British American Oil Producing Co., a discovery in the Tensleep last May for 750 bbl. daily on the pump. This well showed saturation in the Embar on the way down but it was cased off and no test was made. The Stock well is the first test of the Embar in the field.

The prolific Wertz field, southwestern Wyoming, was extended ¼ mile to the northwest in Sinclair-Wyoming Oil Co. 30 Wertz unit, which swabbed 775 bbl. in 24 hours from the Tensleep. It is located on the Sweetwater County side, most of the producers being in Carbon County. Nearest producer to the south is 26-A Wertz, which was completed last January for 300 bbl. in 12 hours through the tubing.

The Stanolind Oil & Gas Co. 1 House, Prowers County, Southeast Colorado, abandoned after testing the Arbuckle, was located 30 miles south of the same company's 1 Snell, abandoned in January of this year. The Prowers County well had the top of the Arbuckle at 2,629 ft. below sea level as compared with 2,067 ft. in the Snell well. Last named was 36 miles northwest of same company's 1 Patterson, Kearny County, Kansas, in which a small discovery was made.

Continental Oil Co. has made a location for its first twin well in the remarkable Circle Ridge field, Fremont County, Wyoming, in its 7 Shoshone-766, CEL SE NE 1-6n-3w. It will be completed in the Embar. Heretofore the Embar production has been cased off and wells completed in the Tensleep. The location is a twin to 3 Shoshone, which was completed late last year at 660 ft. for 191 bbl. in 24 hours from the Tensleep. That test, however, told only part of the tale as the production represented the capacity of the pump and it probably could have made better than 300 bbl. The Embar made 216 bbl. before being cased off.

The two completions in Cut Bank listed this week mark an extreme in distance. The Texas Co. 1 Small, a 22,000,000-ft. gasser, is just 21 miles north of McDonald et al 1 Reickhoff. The latter is the farthest south of any producer in the field.

One bid only was submitted for the two tracts of Navajo Indian Tribal leases on the Bi-clah-bi-to and Tocito domes, San Juan County, Northwest New Mexico. The bid on each tract was submitted by the Continental Oil Co. acting jointly for itself, the Stanolind Oil & Gas Co. and the Standard Oil Co. of Texas. Bid must be approved by the Tribal Council before lease is issued. Lessor is obligated to drill Pennsylvanian tests on each structure, tests to begin within 60 days of signing of lease. First named tract comprises 3,120 acres and the Pennsylvanian is expected at 4,500 ft. The Tocito tract comprises 8,160 acres and depth to drill is approximately 7,000 ft.

COLORADO COMPLETIONS

Holly district, Prowers County: Stanolind Oil & Gas Co. 1 House, C SW NE 32-24s-41w, T.D. 6,200 ft., dry. Following are tops reported: Permian, 685; Blaine, 1,080; anhydrite, 1,769 Topeka, 3,290; Lansing, 3,730; Cherokee, 4,060; Mississippian, 5,275; Viola, 5,936; Arbuckle, 6,130; rotary table elevation, 3,501 ft.

WYOMING COMPLETIONS

Circle Ridge, Fremont County: Continental Oil Co. 6 Shoshone-766, CEL NE NE 1-6n-3w, T.D. 1,270 ft., top Embar 1,020 ft., cased on top of Tensleep, 800 ft., oil in hole, no pumping test, shut in.

Lance Creek, Niobrara County: Continental Oil Co. 4 Rodeon-2, SW SW SW 26-36n-65w, T.D. 4,040 ft., top saturation 3,984 ft., flowed 12½ bbl. an hr. from the Sundance.

Oregon Basin, Park County: Ohio Oil Co. 7 Samuel-OPC, NW NE NW 32-31n-100w, T.D. 3,605 ft., completed in the Embar for 500 bbl.

Wertz, Carbon-Sweetwater counties: Sinclair-Wyoming Oil Co. 30 Wertz unit, NE NW SE 1-26n-90w, T.D. 6,397 ft., top Tensleep 6,116 ft., 7-in. 6,118 ft., swabbed 775 bbl.

MONTANA COMPLETIONS

Cut Bank, Glacier County: Texas Co. 1 E. Small Consolidated Gas Unit, CSL 12-35n-6w, T.D. 2,921 ft., no Sunburst sand, Cut Bank 2,834-2,915 ft., main pay 2,883-2,915 ft., 22,000,000 cu. ft., open flow, 612 lb. pressure.

McDonald, Henderson, Overcash 1 Reickhoff, SE SE NE 36-32n-6w, T.D. 3,110 ft., 7-in. 3,047 ft., no Sunburst sand, upper Cut Bank 3,040-3,102 ft., no lower Cut Bank, main pay 3,040-3,102 ft., 300 ft. oil in hole, will shoot.

Indiana Fields

(Continued from Page 87)

Perry County: United Oil 1 J. L. Polk, NW SE 7-7s-2w, dry at 900 ft.

Posey County: Central States 2 Hermson, NE SE NW 30-6s-12w, pumped 30 bbl., 80-qt. shot on bottom, Mansfield 1,073 ft., T.D. 1,099 ft.

Carter and Gulf 1 Erwin, 1-7s-14w, salt-water disposal well, sand 869-910 ft., 928-61 ft., 964-78 ft., 60-qt. shot 949-79 ft., perf. 872-908 ft., T.D. 980 ft.

Carter and Gulf 1 J. Black Comm., NE SE 11-7s-14w, pumped 90 bbl., 500 gal. acid, perf. 2,832-52 ft., 2,783-87 ft., 2,744-48 ft., T.D. 2,919 ft.

Carter and Gulf 1 J. Gempler et al, SW SE SE 36-6s-14w, pumped 166 bbl., 40-qt. shot 1,287-1,300 ft., Mansfield 1,266 ft., pay 1,280-1,300 ft., T.D. 1,308 ft.

Central States 1 Schrieber, NE SE NE 25-6s-13w, dry, old well deepened from 1,653-2,039 ft., Kincaid 1,685 ft., Palestine 1,767 ft., Menard 1,799 ft., Waltersburg 1,892 ft., Waltersburg sand 1,912 ft., Vienna 1,977 ft., Benoist sand 2,005 ft.

Sullivan County: Ohio 1 G. Riggs, SW NE 3-8n-10w, dry at 2,541 ft., Ste. Genevieve 1,096 ft., Salem 1,457 ft., New Albany 2,182 ft., Devonian 2,312 ft.

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NORTH CENTRAL TEXAS

Three Zones in Bend Show Oil In Montague County Test

By ROBERT INGRAM

WICHITA FALLS, Tex.—Another new pool in southern Montague County, center of deep exploration in the Fort Worth basin was showing last week with production indicated in three conglomerate zones in the Bend series. Probable discovery was Sinclair Prairie Oil Co. 1 Eanes, Bench Survey, 7 miles southwest of Bowie.

First zone to show was eroded Caddo lime topped at 5,812 ft. It was cored from 5,818 ft. to 5,833 ft., recovered 7 ft. of limy to sandy shale, 1 ft. of hard dry conglomerate, 1 ft. of black shale, 9 in. of hard conglomerate with stain and 6 in. of soft conglomerate showing oil. A drill-stem test at 5,814-33 ft. showed air in 5 minutes, recovered 240 ft. of heavily oil-cut mud in the next 25 minutes.

After drilling and coring ahead, it found soft conglomerate showing oil at 5,918-21 ft., cored to 5,926 ft. in conglomerate and recovered 210 ft. of oil and 75 ft. of oil-cut mud on a 30-minute drill-stem test at 5,912-26 ft. On the test it showed air in 2 minutes and gas in 6 minutes.

At week's end, the well was preparing to drill-stem test a third zone at total depth 5,952 ft. It drilled conglomerate showing oil at 5,938-40 ft., cored from 5,940 ft. to 5,952 ft. and recovered 3 ft. of soft porous conglomerate showing oil, 2 ft. of hard conglomerate with stain, 2½ ft. of limy shale and 3 ft. of hard conglomerate with a stain.

In the same area, 5½ miles to the southeast in Wise County, Stanolind 1 Menasco was drilling at 6,003 ft. in broken lime and shale after recovering 20 ft. of oil, 110 ft. of oil-cut mud and 40 ft. of salt wate on a 30-minute drill-stem test at 5,808-26 ft., also in conglomerate. A 30-minute test at 5,829-34½ ft. recovered mud with no shows.

Continental Oil Co. 1 Hildreth, Section 53, E.T. Survey, 6 miles north of Bowie, after testing on swab at total depth 7,201 ft. in Simpson lime, was drilling ahead at 7,206 ft. in sandy lime. It swabbed about 40 to 50 bbl. daily from the section at 7,100-7,201 ft., thus indicating a new field.

Continental 1 Ketchum, Block 43, Hill C.S.L. Survey, 2 miles east of Bowie, drilled lime with slight show of oil at 6,171-74 ft., and was preparing to core ahead.

Continental 1 Richardson, W. D. Savage Survey, southeast offset to the 1 Mueller discovery well, ran electrical log to 7,136 ft., then drilled lime with broken stains from 7,136 ft. to 7,155 ft., where it was preparing to core ahead. It is now in the same zone as the Mueller pay.

Ellenburger at Vogtsberger

Possible opening of Ellenburger production on the west side of the Vogtsberger pool in northern Archer County was indicated at Perry Browning 1 fee, Lot 87, Block 7, G.E.C. Survey. After a 3-day shut-in, it was opened and found to have 200 ft. of oil in the hole. Tops: Lower Strawn sand, showing oil, 4,935-46 ft. and 4,498-4,955 ft.; Caddo lime, 5,120 ft.; Mississippi lime, 5,215 ft.; Ellenburger, 5,216 ft. Total depth is 5,321 ft. in the Ellenburger.

NORTH TEXAS COMPLETIONS

Wildcats

Archer County: J. Story 1 C. L. Abercrombie, SW NE Sec. 1, H.&W. Sur., A-727, dry, T.D. 1,331 ft.
W. C. Young et al 1 J. T. Richardson-B, Lot 17, J. Scott Sur., A-374, dry, T.D. 1,260 ft.
Montague County: S. H. Fagadau 1 J. C. Le Force, J. Short Sur., A-604, dry, T.D. 4,507 ft.
Young County: Hanlon-Buchanan 1 H. B. Street et al. J. Conner Sur., A-57, dry, T.D. 2,671 ft.
Panhandle Refining 1 W. Brundidge et al, J. T. Townsend Sur., A-1645, gaged 7,500,000 cu. ft. gas after acid, lime pay 3,382-95 ft., T.D. 3,550 ft., P.B. 3,400 ft., *discovery*.

Fields

Consolidated, Wilbarger County: Consolidated Oil 3 G. B. Ancell, Jr.-N., NE SE Sec. 35, Blk. 6, H.&T.C. Sur., dry, T.D. 4,549 ft.
Davenport, Montague County: Seitz, Comegys & Seitz 1 E. B. King-B, E. B. Wooten Sur., A-840, pumped 20 bbl., sand 1,630-80 ft., T.D. 2,517 ft., P.B. 1,683 ft.
Forestburg, Montague County: Sinclair Prairie 4 I. M. Jones, M. R. Box Sur., A-52, flowed 1,339 bbl., pay 7,098-7,128 ft., T.D. 7,220 ft.
Freeman-Hampton, Archer County: Fain-McGaha 31 W. P. Ferguson, Sec. 2, S.P.R.R. Sur., A-968, T.D. 667 ft., input well.
Fain-McGaha 9 W. P. Ferguson-Gray, Sec. 2, S.P. R.R. Sur., A-968, T.D. 658 ft., input well.
Hoefle, Jack County: Standard Oil of Texas and Hanlon-Buchanan 1 Mrs. J. B. Jackson, NW Sec. 1, S.P.R.R. Sur., A-579, junked, T.D. 610 ft.
Iowa Park, Wichita County: Grace & Grace 2 Mrs. T. P. Dorris estate, SE SE Sec. 4, H.T.&B. Sur., A-551, pumped 5 bbl., sand 800 ft., T.D. 805 ft.
Joy, Clay County: Shell 1 T. H. Brock, Lot 30, H. Williams Sur., A-704, flowed 2,092 bbl. after acid, lime pay 5,942 ft., T.D. 5,614 ft.
K.M.A.-Ellenburger, Wichita County: Bridwell Oil 2-E Mrs. Anna Mangold, Lot 34, P. Castleman Sur., A-35, flowed 512 bbl., pay 4,277 ft., T.D. 4,310 ft.
Kadane-Griffith 7-E Mrs. Anna Mangold-B, Lot 39, P. Castleman Sur., A-35, flowed 1,650 bbl., pay 4,240 ft., T.D. 4,304 ft.
Lewis Production 11-E Wichita National Bank, W. H. Spillers Sur., A-258, dry, T.D. 4,350 ft.
Knox, Young County: Mudge Oil 7 Mrs. W. B. Harrison, Sec. 3407, T.E.&L. Sur., flowed 300 bbl., pay 4,044 ft., T.D. 4,120 ft.
Muenster, Cooke County: C. & L. Oil 8 J. J. Perkins-A, T. F. Bates Sur., A-849, dry, T.D. 1,247 ft.
Petrolia, Clay County: Webb-Taylor 1 Benjamin Oil & Gas, NE NW Sec. 51, Parker C.S.L. Sur., A-874, dry, T.D. 900 ft.
Ringgold, Clay County: Gulf 7 W. B. Worsham estate, NW NE Sec. 37, H.&T.C. Sur., Blk. 4, pumped 28 bbl. after shot, pay 5,497-5,657 ft., T.D. 6,220 ft., P.B. 5,657 ft.
Texas 1 H. D. Stine, SW SE Sec. 24, Blk. 4, H.&T.C. Sur., flowed 295 bbl., pay 5,560-5,614 ft., T.D. 5,556 ft.
Ross, Clay County: Continental et al 9 O. O. Ross, Jr., S½ N½ Sec. 31, William Walker Sur., A-703, pumped 245 bbl. after shot and acid, lime pay 5,386 ft., T.D. 5,444 ft.
Scotland, Archer County: Shell 4 W. M. Coleman-C, H. S. Smith Sur., A-396, flowed 1,124 bbl. after acid, lime pay 5,065-5,100 ft., T.D. 5,350 ft.
Sewell, Young County: Stanley A. Thompson 3 J. C. Vaughn-A, SW SW Sec. 4, T.&N.O. Sur., A-1796, dry, T.D. 4,347 ft.
Seymour, Baylor County: Jordan Petroleum 1 Fayette County-Omohundro, Fayette C.S.L. Sur., A-148, pumped 45 bbl. oil and 75 bbl. water after acid, lime pay 3,022 ft., T.D. 3,026 ft.
Stoneburg, Montague County: Continental 1 Menefee & Hardy, NE NE NW Sec. 10, Limestone C.S.L. Sur., A-421, dry, T.D. 6,682 ft.
Thornberry, Clay County: George G. Golden 1 P. Roop, Lot 10, Thornberry subd., dry, T.D. 1,158 ft.
Walnut Bend, Cooke County: Sinclair Prairie 8 D. A. Cox-A, SE NW Sec. 59, Fannin C.S.L. Sur., pumped 325 bbl., pay 4,891 ft., T.D. 4,906 ft.
Worsham-Steed, Jack County: Paul P. Steed et al 1 H. H. Flowers et al, D. Crenshaw Sur., A-128, pumped 70 bbl., pay 4,692 ft., T.D. 4,716 ft.

Miscellaneous

Archer County: C. T. Robertson 1 M. Talbot, Sec. 2421, T.E.&L. Sur., dry, T.D. 1,495 ft.
W. E. Production 3 J. F. Ebnother, Sec. 102, J. W. Harris subd., potential 220 bbl., sand 1,274 ft., T.D. 1,280 ft.
W. E. Production 4 J. F. Ebnother, Sec. 102, J. W. Harris subd., pumped 25 bbl., sand 1,260 ft., T.D. 1,265 ft.
White & Duncan 3 J. T. Richardson, M. M. Laney Sur., A-1177, potential 50 bbl., sand 1,235 ft., T.D. 1,237 ft.
Cooke County: W. T. Lucas 1 H. E. King, M. Langham Sur., dry, T.D. 1,070 ft.

New Pool Opened in Taylor County

Taylor County had a new oil pool last week at Butler & Horne Drilling Co. 1 S. M. Reddin, SW SW Section 25, Block 17, T.&P. Survey, 2½ miles southwest of the Wimberly pool in Jones County. The well drilled into the Flippen sand pay at 2,249-51 ft., total depth, filled up with oil in 1 hour and started flowing, making steady heads every 10 or 12 minutes. Seven-inch casing was set at 2,249 ft. on top of the sand, and was to drill plugs early this week.

Before completing the well, Butler & Horne, who own a 1,200-acre block around the well, staked two locations offsetting the new well. No. 1 Frazier was a west offset, SE SE SE Sec. 26, and 1 Hudson, a south offset, 780 ft. from the west line and 519 ft. from the north line of Block 3, J. H. Nabors Survey.

Indications that Runnels County might have a new pay area were seen in reports that Pawnee Royalty Co. planned a completion attempt at 1 L. A. David, Section 330, Block 64, F. J. Ford Survey, 3 miles southeast of Winters, and 6 miles northwest of the McMillan (Ladd) field. It drilled in sand showing oil from 2,450-65 ft., total depth, filled up 1,020 ft. with oil and 30 ft. of salt water in 7 hours, and was to run casing.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Coleman County: Ungren & Frazier 1 M. W. Whitt, Sec. 3, G.H.&H. Sur., dry, T.D. 1,809 ft.
Nolan County: Tex-Harvey 1-A C. W. Tipton, Sec. 43, Blk. 19, T.&P. Sur., dry, T.D. 5,429 ft.
Shackelford County: Fain-McGaha 1 J. P. Morris estate-B, Sec. 167, E.T. Sur., dry, T.D. 1,704 ft.

Fields

Short: M. J. Delaney 2 O. L. Short, Sec. 191, B.B.B. &C. Sur., flowed 53 bbl. in 5 hr. through ⅝-in. tubing choke natural, est. 175 bbl., lime 3,247 ft., T.D. 3,253 ft.
Wimberly, Jones County: Fain-McGaha 1 L. L. Horne, G. Martinez Sur. 137, flowed 90 bbl. in 3 hr. through ¾-in. tubing choke natural, est. 450 bbl., lime 2,403 ft., T.D. 2,413 ft.

EASTERN TEXAS

Chapel Hill Outpost Makes Small Flow in Upper Pettit Zone

By ROBERT INGRAM

DALLAS, Tex.—Somewhat disappointing on initial pay attempt, testing continued throughout the week at Sinclair Prairie 1 Swinney, Lockhart Survey, 2-mile south outpost to the Chapel Hill field in Smith County. Testing was in the Pettit where casing had been perforated at 8,236-80 ft. with 290 shots. On first attempt to make a well, it was treated with 4,000 gal. of acid, but returned no shows in swabbing down 6,200 ft.

It then pulled tubing, was reperforated in the two upper Pettit zones at 8,200-26 ft. with 156 shots and at 8,158-62 ft. with 24 shots, ran tubing and reran tubing. After treating again with 4,000 gal. of acid in the two upper zones, the well was flowed with high-pressure gas for 49 minutes, then started swabbing and was recovering about ¼ gal. of oil with each trip of the swab to 7,000 ft.

Next day, after continuous swabbing, gas broke through and flowed for 30 minutes. The well was shut in for 4 hours. When opened, it kicked off in 1 hour through ½-in. choke and flowed 14 bbl. of oil in the next 11½ hours with tubing pressure 150 lb., casing pressure 400 lb. It stopped flowing after input high-pressure gas was shut off, stood for 10 hours and did not flow. Input gas was turned back on and the well began flowing again averaging 1 bbl. of oil an hour.

Meantime, on the east edge of the field, C. R. Starnes 1 Spencer, L. H. Dillard Survey, flowed 80 bbl. of fluid in 8 hours through ¼-in. choke, mostly oil with some water, then died; shut in, it failed to flow when opened again, and resumed swabbing.

Limit Seen for Coke Field

Magnolia Petroleum Co. 1-B Robinson heirs, Knight Survey, one location east of Amerada 2 Faulk, topped oil sand at 6,310 ft., and was coring at 6,340 ft. Although it was running around 60 to 70 ft. lower on top of the sand than the field's discovery well, it was believed high enough to produce. However, it indicated that the next location to the east would be doubtful at best.

On the southwest edge, General American 1 Skeen, M. Y'Barbo Survey, had the base of the Goodland at 6,330 ft., topped water sand at 6,378 ft., set pipe after going to total depth of 6,409 ft. It had an estimated 30 ft. of net oil sand between 6,330 ft. and 6,378 ft., and also indicated that another location to the southwest would be dry.

Thus, unless the field goes farther north than

expected, about 30 wells on the present spacing pattern will drill it up. Fifteen proven locations have already been or are now being drilled.

Cherokee Discovery Testing

Completion attempts were slow at Humble Oil & Refining Co. 1 Curtis, John Vaughn Survey, deep Pettit lime discovery on the Larissa-Bullard structure of northwestern Cherokee County. First effort to acidize was a failure, the lime not taking the acid, and a second attempt was to be made through perforations in casing at 10,160-10,200 ft. However, when bailing started, the well cleaned itself and instead of reacidizing, operator plans to squeeze and reperforate at 10,160-10,212 ft. and then try the acid again.

EAST TEXAS COMPLETIONS

Wildcats

McLennan County: C. D. Neff 1 E. B. Smith, W. F. Chapman Sur., dry, Buda 1,742-80 ft., Georgetown lime 1,850 ft., Pettit 3,484 ft., Travis Peak 3,612 ft., massive anhydrite 3,126 ft., Glen Rose 2,325 ft., T.D. 3,842 ft.

Upshur County: O. J. Perrin 1 Mrs. R. H. McClelland, M. Del Torres Sur., 5 mi. SE of Gilmer, dry, T.D. 5,353 ft.

Fields

Chapel Hill, Smith County: Chapel Hill Gas 1 J. W. Elliott, T. P. Payne Sur., gaged 3,480,000 cu. ft. gas through ⅞-in. choke, gas-oil ratio 18,200:1, T.P. 2,371 lb., C.P. 2,480 lb., gravity 64.2, Georgetown lime 4,435 ft., T.D. 8,122 ft.

Shell 2 Henry Campbell, J. D. Parchman Sur., flowed 475 bbl. through ¼-in. choke, 443,000 cu. ft. gas, gas-oil ratio 930:1, gravity 42.3, T.D. 8,150 ft.

Club Lake, Hunt County: D. H. Byrd 1 E. E. Wilson, John Warren Sur., dry, Pecan Gap 1,083-1,290 ft., Gober 1,718 ft., Austin chalk 2,498 ft., sand 2,846-54 ft., T.D. 2,948 ft.

Humble 1 Aetna Life, A. B. Cunningham Sur., dry, T.D. 2,885 ft.

Hawkins, Wood County: Humble 1 C. W. Cumbie, H. M. N. McKnight Sur., dry, Pecan Gap 3,150-3,363 ft., Woodbine 4,699 ft., T.D. 4,990 ft.

Stanolind 4-D C. W. B. Missions, S. Castleberry Sur., flowed 73 bbl. in 6 hr. through ¼-in. tubing choke, perf. 4,700-10 ft., T.D. 4,821 ft.

MICHIGAN OPERATIONS

Oil Found in Sylvania Sand In Winterfield Deep Test

By OTTO C. PRESSPRICH

SAGINAW, Mich.—Heralded as a deep pay discovery, Pure Oil Co. 1 McClain, first deep test in the Winterfield pool, was reported flowing as much as 200 bbl. a day. In Section 4 of the big Clare County natural-gas and oil pool, the production comes from a depth of 5,067 ft. and may be the best yet developed at that depth in Michigan. Source of the oil is the Sylvania formation, first commercial production from that stratum in the state. Smaller deep tests are producing in the Headquarters and Richfield sections of Roscommon County and in the Adams-Arenac area. Pure may drill deeper as an experiment.

Eugene V. Hilliard of Mount Pleasant last week brought in the first well in Michigan on land owned by the federal Government. Developed on Department of Agriculture Forestry Division acreage in Section 4 of Franklin Township, Clare County, the well's estimated natural initial was 548 bbl. Completed at 3,345 ft., it is ⅛-mile southerly extension to the field.

Throughout Michigan last week, operators completed 17 tests, bringing in seven more oil wells and one natural-gas producer. Completions were reported from 12 counties, a majority of the failures being wildcat tests. Best of the new wells is the Hilliard test in Franklin Township. Good results were obtained in a well drilled in Akron Township, Tuscola County, by Frank Norton and Ray Mell. Initial production from 3,515 ft. was at the rate of 310 bbl. a day.

MICHIGAN COMPLETIONS

Allegan County, Heath Township: Fortney-Broughton and W. Spencer Cook 1 Sawyer, NE SE SW Sec. 24, wildcat, dry at 1,523 ft.

Wayland Township: James J. McGerry 1 Dean & Horvath communitized, SW SW NE Sec. 26, wildcat, dry at 1,738 ft.

Arenac County, Adams Township: Ervin Major 1 McTaggart, NE SW NE Sec. 26, dry at 4,950 ft.

Bay County, Monitor Township: Chapman Oil Co. 1 Schultz, NW NE NW Sec. 2, pumped and flowed 220 bbl., acidized, T.D. 2,904 ft.

Clare County, Franklin Township: Eugene Hilliard 1 USA, N½ SE SE Sec. 4, est. 548 bbl., natural, T.D. 3,345 ft.

Winterfield Township: Taggart Bros. 122 Brown-Van Buren, NW Sec. 17, dry at 1,343 ft.

Taggart Bros. 123 State-Van Deusen, SW Sec. 35, 2,650,000 cu. ft. gas, T.D. 1,307 ft.

Isabella County, Isabella Township: Michigan Devonian Pet. Co. and F. Ketcham 1 Horan, NW SE Sec. 2, 5 bbl., acidized, T.D. 3,741 ft.

Lake County, Sauble Township: Gordon Oil Co. 1 Myers estate,, NE NE SW Sec. 16, flowed 300 bbl., T.D. 2,136 ft.

Yates Township: C. L. Maguire Corp. 1 Horojko, SW SE SW Sec. 2, wildcat, dry at 3,510 ft.

Lenawee County, Deerfield Township: Neil J. Berston, Jr., 2 Heath, SW SE SE Sec. 13, wildcat, dry at 2,320 ft.

Mecosta County, Hinton Township: Columbia Oil & Gas Co. 1 Satterlee, NW SW Sec. 24, wildcat, dry at 3,790 ft.

Montcalm County, Douglass Township: American Production Co. et al 1 Buchholz communitized, NW SE SW Sec. 21, wildcat, dry at 1,223 ft.

Osceola County, Richmond Township: Louis Rose 1 Bechter-Fulmerhouser, N½ SW SW Sec. 4, flowed 120 bbl., acidized, T.D. 3,533 ft.

Ohio Oil Co. A-2 Clark, SW NW Sec. 4, flowed 78 bbl., acidized, T.D. 3,549 ft.

Roscommon County, Lyon Township: Sun Oil Co. 1 Hart & Hartwick trust, N½ NW NE Sec. 33, wildcat, dry at 4,548 ft.

Tuscola County, Akron Township: Frank Norton and Ray G. Mell 1 Beaty, SW NW SE Sec. 30, flowed 310 bbl., acidized, T.D. 3,414 ft.

Permian Basin, Panhandle

(Continued from Page 84)

casing and tubing, after acid, pay 3,470 ft., T.D. 3,482 ft.

TEXAS PANHANDLE COMPLETIONS

Carson County: Skelly 153 Schafer ranch, Sec. 196, Blk. 3, potential 478 bbl. after shot, pay 3,122 ft., T.D. 3,192 ft.

Stanolind 1 Cooper, Sec. 5, Blk. 9, potential 50 bbl. after shot, pay 3,066-3,168 ft., T.D. 3,178 ft.

Gray County: Wilcox Oil & Gas 40 Worley-Reynolds, Sec. 31, Blk. 3, potential 58 bbl. from granite wash, T.D. 3,087 ft.

Hutchinson County: Continental 5 Sanford-D, Sec. 77, Blk. 46, potential 63 bbl., pay 2,829-58 ft., T.D. 2,861 ft.

Shell 1 Keeler-A, Sec. 71, Blk. Z, potential 141 bbl., shot 3,019-69 ft., T.D. 3,069 ft.

Stekoll, Inc., 2 North-Christian, Sec. 31-A, Blk. V, pumped 30 bbl. oil and 40 bbl. water, pay 3,000-45 ft., T.D. 3,045 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Wildcat, Chaves County: J. O. Wood 1 Green, NE SW 7-7-29, dry, T.D. 2,115 ft. in anhydrite.

Wildcat, Lea County: Gordon M. Cone 1 Superior-State, NE SW 30-18-37, dry, T.D. 810 ft.

Arrowhead, Lea County: Humble 3-G State, NE SE 26-21-36, dry, T.D. 3,960 ft.

West Eunice, Lea County: Wilson Oil 10 State, SE SW 13-21-34, dry, T.D. 3,842 ft.

Maljamar, Lea County: Johnny Cockburn 4-B Miller, SE NW 25-17-32, flowed 140 bbl. in 4 hr., pay 4,106 ft., T.D. 4,200 ft., shot.

Monument, Lea County: B. H. Nolen 2 Laughlin, NE SE 4-20-37, flowed 11 bbl. an hr. through choke, pay 3,852-96 ft., acid.

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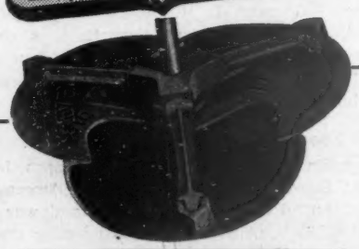

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NORTH LOUISIANA, ARKANSAS

Possible Travis Peak Discovery in Union County, Arkansas

SHREVEPORT, La.—Arkansas had promise of another discovery as Amerada Petroleum Co. cemented casing in 1 S. S. Turbeville, Union County, preparatory to testing the Travis Peak. Drilling was halted in the Buckner lime at 6,290 ft., and 3,300 ft. of casing is being cemented after side-wall cores showed favorable possibilities in the Travis Peak at 3,154-63 ft. Location is in 4-18s-12w.

In Miller County, Carter Oil Co. was scheduled to test 1 Lena E. Orr after cementing casing at 7,550 ft. Total depth is 7,700 ft. The Smackover lime was topped at 7,338 ft. and porosity was logged at 7,346-7,425 ft. A drill-stem test in the Buckner lime 2 weeks ago tested 35 lb. working pressure and some gas which enhances the prospects of developing production in the Smackover.

ARKANSAS COMPLETIONS

Wildcat, Lafayettee County: Tide Water 1 Bendaw, NE NW 32-17-24w, flowed 143 bbl. of oil in 10 hr., Smackover 9,270-9,330 ft.

Wildcat, Ouachita County: The Hunter Co. 1 Morgan, NW SW 16-15-19w, dry, T.D. 3,753 ft., Nacatoch 1,563 ft., base chalk 2,128 ft., James 3,271-3,310 ft.

El Dorado, Union County: Curtis Kinard 1 McCurry, SW SW 19-17-14w, pumped 25 bbl., Nacatoch 2,172-92 ft., T.D. 2,904 ft.

New London, Union County: Marine Oil 1 Brooks, SE NE 13-18-12w, flowed 6 bbl. an hr., T.D. 5,865 ft.

Stephens, Columbia County: G. H. Vaughn, Jr. 1 Green, SW SE 11-15-20w, pumped 75 bbl., sand 3,446 ft., T.D. 3,485 ft.

NORTH LOUISIANA COMPLETIONS

Wildcats

Claiborne Parish: Skelly and Sunray 1 Kinnebrew, SE NE 26-20-7w, dry, T.D. 6,843 ft., Nacatoch 2,227-2,308 ft., Saratoga 2,404-68 ft., Woodbine 3,665-3,775 ft., Paluxy 3,775 ft., James 5,532-79 ft., Pettit 6,019 ft., Travis Peak 6,159 ft.

La Salle Parish: H. L. Hunt F-117 Goodpine, NE NE 7-7-4, dry, T.D. 5,245 ft., Cockfield 1,090 ft., Sparta 1,798 ft., Wilcox 2,609 ft., Midway 5,140 ft.

Peterson Pet. 1-A Drewett unit, SW NW 6-8-4, dry, T.D. 5,025 ft., Wilcox 2,530 ft., Midway 5,002.

Richland Parish: Calhoun, Jones & Gower 1 McCoy, NW SE 29-16-6, dry, T.D. 4,520 ft., Wilcox 1,089 ft., Midway 1,885 ft., Glen Rose 3,185 ft.

Fields

Ajax, De Soto Parish: J. E. Watts 1 Crockett, NE SE SW 13-10-11w, dry, T.D. 3,280 ft.

Haynesville, Claiborne Parish: R. A. Stacy 1 Cadenhead, NE SW 24-23-8w, flowed 152 bbl. in 4 hr., Pettit 5,299-5,318 ft., 5,362-67 ft., T.D. 5,400 ft.

Cook Drlg. 1 Waller, SW SW 12-23-8w, flowed 170 bbl. in 3 hr., Pettit 5,258-78 ft., T.D. 5,340 ft.

T. L. James & Co. 2 Waller, SW NW 12-23-8w, flowed 96 bbl. in 2½ hr., Pettit 5,290-5,310 ft., T.D. 5,370 ft.

Midstates Oil 2 Waller, E½ SW 2-23-8w, flowed 396 bbl. in 9 hr., Pettit 5,331-48 ft., T.D. 5,415 ft.

Ohio Oil 1 Lonnie Lowe Unit P, NE NE 17-23-8w, flowed 192 bbl. in 10 hr., Pettit 5,380-89 ft., 5,432-40 ft., T.D. 5,500 ft.

Logansport, De Soto Parish: Southern Prod. 1 Cox unit, NW NW SE 6-11-15w, 83,000,000 cu. ft. gas, perf. 4,920-54 ft., T.D. 5,005 ft.

Nebo, La Salle Parish: H. L. Hunt F-115 Goodpine, SW NE 28-7-3, flowed 185 bbl., perf. 3,496-3,504 ft., T.D. 4,289 ft.

Sligo, Bossier Parish: Triangle Drlg. 1 Thigpen-Herold, NE SW 19-17-11w, pumped 50 bbl., porous lime 3,160-68 ft., T.D. 3,182 ft.

Willow Lake, Catahoula Parish: Ice Belt 1 Barber, SE SE NW 1-6-6, dry, T.D. 5,825 ft.

NORTH MISSISSIPPI

British American Oil Producing Co. has apparently established commercial production in the Gray area, Sharkey County, as 2 F. B. Houston is reported to have flowed at the rate of 7 bbl. of oil per hour, plus 2 per cent salt water, through a 10/64-in. choke. Gravity of the oil was 25.5. This well is located a short distance from the company's 1 Houston, which showed possible production several months ago. The well is now shut in and is to be conected to a 10,000-bbl. storage tank near the well.

CANADIAN FIELDS

Devonian Tests Planned For Turner Valley Field

By VICTOR LAURISTON

CHATHAM, Ont.—Crude and natural-gasoline production for all Albert fields for the week ending August 24 averaged 27,087 bbl. daily compared with 27,545 bbl. daily for the previous week and 27,441 bbl. daily for the corresponding week last year.

Permit has been issued for the drilling of a Devonian test on a West Central Turner Valley location previously allotted to Royalite Oil 66 in LSD 2, 25-19-3w5. A fund of $250,000 for a unitized test which will be carried through the Madison limestone and Banff shales to test the underlying Devonian limestone has been subscribed by a group of Turner Valley companies. The participants include Royalite Oil Co., $135,000; Anglo-Canadian Oil, $35,000; Home Oil, $25,000; Calgary & Edmonton Corp., $25,000; C.P.R., $10,000; Okalta Oils, $5,000, and Calmont Oils, Davies Petroleum, Chinook Oils, Royal Canadian Oil Co. and Union Drilling Co., $2,500 each. The companies will share in any production in proportion to their individual contributions to the cost of drilling, in addition to which the test will prove adjacent acreage in which they are interested. Location offsets the Argus 1 producer which got the Madison lime at 6,909 ft. and finished at 7,384 ft. The Devonian test is estimated 200 ft. higher on structure, and is expected to drill through 1,500 ft. of Madison and 700 ft. of Banff shales, entering the Devonian lime around 9,100 ft. The location is north and west of the old Home Oil tract in Section 20-19-2w5, where some of the most prolific producers in the early naphtha field were drilled. This will be the first test in Turner Valley carried to the Devonian, though McLeod Oil 4 in the old central naphtha area was drilled into the Banff shales. Test will be spudded this fall, and is expected to be completed in about 6 months. Drilling Contractors, Ltd., will handle the contract. Should production be secured in the Devonian, it is expected that a number of Madison limestone wells will be deepened to the lower horizon.

Taber Field

In the Taber field, southern Alberta, Standard-C.P.R. 2, LSD 12, 17-9-16w4, is below 2,322 ft. with production expected around 3,300 ft. Clancey-Hi Test 1, LSD 7, 24-9-17w4, is below 2,700 ft. Atlas Investments of Calgary is arranging for a development program on acreage of Hunter & Levis, which is being reported on by S. E. Slipper of Calgary. The drilling wells are taking crude from Standard-Province 1 producer for fuel oil. This production comes from an horizon above the Madison lime, originally supposed to be the Sunburst sand, but now identified by Joseph S. Irwin, geologist, of Calgary, as the Cut Bank sand of Montana and the Dalhousie of Turner Valley.

Fort Norman Operations

While little detailed information has been given out, it is definitely known that extensive operations are being carried on at Norman Wells, 53 miles north of Fort Norman, on the Mackenzie River. Refinery workers, drillers, and pipe-line and construction tradesmen were moved north this spring and already several additional wells have been completed. Production is encountered at shallow depth, and some of the wells completed have averaged better than 100 bbl. daily. Drilling operations are being continued, and additions are being made to the Imperial refinery, which heretofore has merely supplied the northern trade. No definite information as to the proposed pipe line to White Horse in the Yukon Territory or some other point convenient to the Alaska Highway has yet been made public.

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CRUDE PRICES . . .

OKLAHOMA AND KANSAS GRAVITY TABLES

	1	2	3	4	5	6	7
Below 21	...	...	...	...	$.85	$.75	...
21-21.9	...	...	...	...	.87	.78	...
22-22.9	...	...	...	...	.89	.81	...
23-23.9	...	...	...	...	.91	.84	...
24-24.9	...	...	...	...	.93	.87	...
Below 25	$.93	...	...	$.86	...	...	...
25-25.9	.95	$.95	...	.88	.95	.90	...
26-26.9	.97	.97	...	.90	.97	.93	...
27-27.9	.99	.99	...	.92	.99	.96	...
28-28.9	1.01	1.01	$1.01	.94	1.01	.99	...
29-29.9	1.03	1.03	1.03	.96	1.03	1.02	...
30-30.9	1.05	1.05	1.05	.98	1.05	1.05	$1.05
31-31.9	1.07	1.07	1.07	1.00	1.07	1.07	1.07
32-32.9	1.09	1.09	1.09	1.02	1.09	1.09	1.09
33-33.9	1.11	1.11	1.11	1.04	1.11	1.11	1.11
34-34.9	1.13	1.13	1.13	1.06	1.13	1.13	1.13
35-35.9	1.15	1.15	1.15	1.08	1.15	1.15	1.15
36-36.9	1.17	1.17	1.17	1.10	1.17	1.17	1.17
37-37.9	1.19	1.19	1.19	1.12	1.19	1.19	1.19
38-38.9	1.21	1.21	1.21	1.14	1.21	1.21	1.21
39-39.9	1.23	1.23	1.23	1.16	1.23	1.23	1.23
40 and above	1.25	1.25	1.25	1.18	1.25	1.25	1.25

OKLAHOMA AND KANSAS TABLE EXPLANATION

COLUMN (1) MID-CONTINENT GRADES:
Pure Oil Co., 5-20-41.
Gulf Oil Corp., 5-20-41.
Skelly Oil Co. (Kansas only), 5-19-41.
H. F. Wilcox Oil & Gas Co., 5-20-41.

COLUMN (2) MID-CONTINENT GRADES:
White Eagle Oil Purchasing Co., Inc., 5-19-41, Kansas only.
Sinclair Prairie Oil Marketing Co., 5-20-41.

COLUMN (3) MID-CONTINENT GRADES:
Continental Oil Co., 5-19-41.
Phillips Petroleum Co., 5-19-41.
Tide Water Associated Oil Co., 5-20-41.

COLUMN (4) JACKSON, TILLMAN COUNTIES:
Gulf Oil Corp., 5-20-41.

COLUMN (5) MID-CONTINENT GRADES:
Standard Oil Co. (Indiana), 5-20-41.
National Refining Co., 5-20-41.

COLUMN (6) MID-CONTINENT GRADES:
Magnolia Petroleum Co., 5-21-41.
Shell Oil Co., Inc., 5-19-41.
Shell, in Carter County, 12-5-41.
Ben Franklin Refining Co., 12-4-41.
Carter Oil Co. (Oklahoma only), 5-19-41.

COLUMN (7) OKLAHOMA:
Champlin Refining Co., 5-20-41.

OKLAHOMA FLAT PRICE

Cumberland $1.14
Pure Oil Co., 9-4-41.

Canadian Fields

Imperial Oil, Ltd.:
Petrolia, 11-6-39 ..... $2.10
Oil Springs, 11-6-39 ..... 2.07
Bothwell, 11-6-39 ..... 2.10
Turner Valley, 7-16-41 ..... $1.35-1.97

MIDDLE WEST FLAT PRICES

Illinois and Indiana

Ohio Oil Co.:
Illinois basin, 5-21-41 ..... $1.37
Eastern Illinois, 5-21-41 ..... $1.22
Western Indiana, 5-21-41 ..... 1.22
Magnolia Petroleum Co.:
Illinois basin, 5-21-41 ..... $1.37
Carter Oil Co.:
Illinois (Louden), 5-21-41 ..... $1.37
Sohio Corp.:
Illinois basin, 5-21-41 ..... $1.37
Texas Co.:
Illinois basin 5-21-41 ..... $1.37
Gulf Refining Co.:
Illinois basin 5-21-41 ..... $1.37

Michigan

Simrall Corp., 5-27-41:
Greendale, Porter, Vernon, Crystal, and Wise $1.44
Buckeye, Bentley, Edenville, Beaverton, and Monitor (sweet) .. 1.42
Freeman, Redding, Lincoln, and Winterfield 1.39
Hamilton-Grout 1.29
West Branch-Arenac 1.24
Sohio Corp., 5-1-41:
Bloomingdale-Columbia $1.38
Mid-West Refineries, Inc., 5-1-41:
Kent County $1.38
Pure Oil Co., 5-27-41:
Sherman $1.39
Midland (Midland County) 1.44

EASTERN STATES

Pennsylvania and Ohio

South Penn Oil Co.:
National lines, 3-26-42 ..... $3.00
Southwest Penn, 3-26-42 ..... 2.65
Eureka lines, 3-26-42 ..... 2.59
Corning grade, 5-27-41 ..... 1.31
Tide Water Associated Oil Co.:
Bradford, 3-26-42 ..... $3.00
Allegany, N. Y., 3-26-42 ..... 3.00
Pennzoil Co.:
Group A, 3-26-42 ..... $2.93
Group B, 3-26-42 ..... 2.92
Group C, 3-26-42 ..... 2.91
Group D, 3-26-42 ..... 2.90
Group E, 3-26-42 ..... 2.88
Quaker State Oil Refining Corp.:
In Buckeye lines, 3-26-42 ..... $2.55
In Eureka lines, 3-26-42 ..... 2.59

Kentucky

Ashland Oil & Transportation Co., 6-19-41:
Big Sandy River $1.38
Kentucky River 1.43
Sohio Corp., 5-21-41:
Birk City $1.32

West Virginia

Pure Oil Co.:
Cabin and Kelly Creek, 3-27-42 .. $2.59

LOUISIANA AND SOUTHERN ARKANSAS GRAVITY TABLE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Below 18	....	....	....	....	....	....	....	....	....	....	....	....	$.94	....	....	....	....	....
18-18.9	....	....	....	....	....	....	....	....	....	....	....	....	.96	....	....	....	....	....
19-19.9	....	....	....	....	....	....	....	....	....	....	....	....	.98	....	....	....	....	....
Below 20	....	....	....	....	....	....	....	$1.06	....	$.94	$.99	$.89	....	....	$1.06	....	....	....
20-20.9	....	....	....	....	....	....	....	1.08	....	.96	1.01	.91	1.00	....	1.08	....	....	....
Below 21	$.68	....	....	$.90	....	....	....	....	....	....	....	....	....	$.90	....	....	....	....
21-21.9	.70	....	....	.92	....	....	....	1.10	....	.98	1.03	.93	1.02	.92	1.10	....	....	....
22-22.9	.72	....	....	.94	....	....	....	1.12	....	1.00	1.05	.95	1.05	.94	1.12	....	....	....
23-23.9	.74	....	....	.97	....	....	....	1.14	....	1.02	1.07	.97	1.08	.96	1.14	....	....	....
24-24.9	.76	....	....	.98	....	....	....	1.16	....	1.04	1.09	.99	1.11	.98	1.16	....	....	....
Below 25	....	$.86	$.98	....	....	$.88	....	....	....	....	....	....	....	....	....	....	....	....
25-25.9	.78	.88	1.00	1.00	....	.90	....	1.18	....	1.06	1.11	1.01	1.14	1.00	1.18	....	....	....
26-26.9	.80	.90	1.02	1.02	....	.92	....	1.20	....	1.08	1.13	1.03	1.17	1.02	1.20	....	....	....
27-27.9	.82	.92	1.04	1.04	....	.94	....	1.22	....	1.10	1.15	1.05	1.19	1.04	1.22	....	....	....
28-28.9	.84	.94	1.06	1.06	....	.96	....	1.24	....	1.12	1.17	1.07	1.21	1.06	....	$1.14	$1.06	....
29-29.9	.86	.96	1.08	1.08	....	.98	....	1.26	....	1.14	1.19	1.09	1.23	1.08	....	1.16	1.08	....
30-30.9	.88	.98	1.10	1.10	$1.28	1.00	....	1.28	....	1.16	1.21	1.11	1.25	1.10	....	1.18	1.10	$1.05
31-31.9	.90	1.00	1.12	1.12	1.30	1.02	....	1.30	$1.07	1.18	1.23	1.13	1.27	1.12	....	1.20	1.12	1.07
32-32.9	.92	1.02	1.14	1.14	1.32	1.04	....	1.32	1.09	1.20	1.25	1.15	1.29	1.14	....	1.22	1.14	1.09
33-33.9	.94	1.04	1.16	1.16	1.34	1.06	....	1.34	1.11	1.22	1.27	1.17	1.31	1.16	....	1.24	1.16	1.11
34-34.9	.96	1.06	1.18	1.18	1.36	1.08	....	1.36	1.13	1.24	1.29	1.19	1.33	1.18	....	1.26	1.18	1.13
35-35.9	.98	1.08	1.20	1.20	1.38	1.10	....	....	1.15	....	....	....	....	1.20	....	1.28	1.20	1.15
Below 36	....	....	....	....	....	....	$1.07	....	....	....	....	....	....	....	....	....	....	....
36-36.9	1.00	1.10	1.22	1.22	1.40	1.12	1.09	....	1.17	....	....	....	....	1.22	....	1.30	1.22	1.17
37-37.9	1.02	1.12	1.24	1.24	1.42	1.14	1.11	....	1.19	....	....	....	....	....	....	....	....	1.19
38-38.9	1.04	1.14	1.26	1.26	1.44	1.16	1.13	....	1.21	....	....	....	....	....	....	....	....	1.21
39-39.9	1.06	1.16	1.28	1.28	1.46	1.18	1.15	....	1.23	....	....	....	....	....	....	....	....	1.23
40 & above	1.08	1.18	1.30	1.30	1.48	1.20	1.17	....	1.25	....	....	....	....	....	....	....	....	1.25

LOUISIANA AND SOUTHERN ARKANSAS TABLE EXPLANATION

Standard Oil Co. of Louisiana, 5-22-41.

COLUMN (1) applies to Atlanta, Buckner, Magnolia, Schuler (Jones sand), Village, and Lewisville fields.

COLUMN (2) applies to De Soto, Sabine, Fouke, Homer, Miller County, Sugar Creek, and Nebo.

COLUMN (3) applies to Bunkie, Eola, Olla, and South Olla.

COLUMN (4) applies to Bayou Mallet, Choctaw, Darrow, Jeanerette, Lirette, North Crowley, South Crowley, Port Barre, Potash, Roanoke, St. Martinville, and Port Allen.

COLUMN (5) applies to University (Baton Rouge). Posted 6-2-42.

COLUMN (6) applies to Cotton Valley crude, Rodessa and Shreveport (Cross Lake); also Anse La Butte, effective 8-1-41, starting at 80 cents for below 21°, also, to Caddo effective 10-15-41.
Continental Oil Co., 5-21-41.

COLUMN (7) applies to Abbeville, Louisiana.
Stanolind Oil & Gas Co., 5-21-41.

COLUMN (8) applies to East and West Hackberry.

COLUMN (9) applies to Caddo Parish, effective 10-15-41.

COLUMN (9) applies to Evangeline, Acadia Parish.
Lion Oil Refining Co., 5-22-41.

COLUMN (1) applies to Reynolds lime, Jones sand, Schuler, Ark.

COLUMN (2) applies to El Dorado, West and South Rainbow fields, Snow Hill, and Schuler-Morgan sand.
Placid Oil Co., 5-22-41.

COLUMN (3) applies to Olla.

COLUMN (2) applies to Nebo field.
Shell Oil Co., Inc., 5-20-41.

COLUMN (10) applies to Roanoke, Chalkley.

COLUMN (11) applies to Iowa, Black Bayou, White Castle.

COLUMN (12) applies to Gibson, South Houma, Hester, West Lake Verret.
Magnolia Petroleum Co., 5-21-41.

COLUMN (13) applies to Lockport, Cameron Meadows, and West Gueydan, La.

COLUMN (6) applies to Haynesville, Cotton Valley, Rodessa, La., and Miller County, Arkansas.
Phillips Petroleum Co., 3-29-41.
Arkansas Fuel Oil Co., 2-19-42.

COLUMN (1), Schuler (Jones sand), except schedule starts at 76 cents for below 25° gravity.
Gulf Refining Co., 5-21-41.

COLUMN (9), Jennings.

COLUMN (8), Edgerly, Starks, Vinton, East Hackberry, Cameron Meadows, and Leesville.

COLUMN (16) applies to Grand Bay, Quarantine Bay, Timbalier Bay, and West Bay, except schedule starts at $1.12 for below 28° gravity.

COLUMN (6) applies to Caddo, Homer, Bull Bayou, Crichton, De Soto, Haynesville, and El Dorado.

COLUMN (4) applied to West Gueydan, effective 5-25-42.
Pure Oil Co., 4-22-41.

COLUMN (14) applies to Gueydan crude.

COLUMN (6), Caddo, Homer, Haynesville, Bull Bayou, Crichton, De Soto, and El Dorado.
Texas Co., 5-21-41.

COLUMN (6) applies to North Louisiana.

COLUMNS (15) and (16), Bay St. Elaine, Caillou Island, Iberia, Lake Barre, Lake Pelto, Leesville, Port Barre. (Schedules A and B).

COLUMN (17), Bateman Lake, Dog Lake, Fausse Point, Horseshoe Bayou, Jefferson Island, Plumb Bob, Vermilion Bay, West Cote Blanche, and Delta Duck Club.

COLUMN (18), Delta Farm, Lake Salvador, Golden Meadow.

LOUISIANA AND ARKANSAS FLAT PRICES

Continental Oil Co., 5-21-41:
Tepetae and Lake Arthur $1.18
Ville Platte 1.20
Gulf Refining Co., 5-21-41:
Smackover (Ark.) $0.83
Lion Oil Refining Co., 5-22-41:
Smackover (heavy) $0.83
Dorcheat 1.15
Phillips Petroleum Co., 5-22-41:
Smackover (heavy) $0.83
Placid Oil Co., 5-22-41:
Tullos-Urania (5-21-41) $1.15
Cotton Valley dist. (above 60°) 1.30
Cotton Valley (Holloway sand) .. 1.25
Cotton Valley (Bodcaw-D sands) . 1.30
Pure Oil Co.:
Bosco (5-21-41) $1.14
Sweet Lake (5-22-41) 1.06
Creole (5-22-41) 1.16
Republic Oil Co., 6-2-41:
Nevada County, Arkansas $0.80
Shell Oil Co., Inc., 5-20-41:
Happytown $1.15
Standard Oil Co. of Louisiana, 5-22-41:
Big Creek, Dorcheat, McKamie (sour) $1.15
Smackover (heavy) ..... .83
Cotton Valley distillate (9-1-41) .. 1.40
Cotton Valley (Holloway sand) .. 1.25
Lisbon distillate 1.20
Republic Oil Refining Co., 5-21-41:
Bayou Pigeon $1.20
Texas Co., 5-21-41:
Erath $1.21
Garden Island 1.36
Lafitte, Paradis 1.19
Lake Mongoulois 1.36

ROCKY MOUNTAIN GRAVITY TABLE

Below 29	$0.96
29-29.9	.98
30-30.9	1.00
31-31.9	1.02
32-32.9	1.04
33-33.9	1.06
34-34.9	1.08
35-35.9	1.10
36-36.9	1.12
37-37.9	1.14
38-38.9	1.16
39-39.9	1.18
40 and above	1.20

Stanolind Oil & Gas Co., 5-20-41, includes Dutton Creek, Midway, and Salt Creek except Tensleep crude, Wyoming.

Sinclair-Wyoming Oil Co., 5-20-41, includes Salt Creek and Lost Soldier, except Tensleep crude, Wyoming.

Continental Oil Co., 5-21-41, includes Fort Collins and Wellington, Colorado.

Wyoming

Ohio Oil Co.:
Rock River (5-20-41) $1.15
Lance Creek (7-1-41) 1.12
Elk Basin and Grass Creek (light) 1.00
Stanolind Oil & Gas Co., 5-20-41:
Frannie (light) ..... .70
Frannie (heavy) ..... .47
Grass Creek (light) 1.00
Grass Creek (heavy) ..... .50
Hamilton dome ..... .45
Elk basin 1.00
Salt Creek (Tensleep) ..... .6785
Continental Oil Co.:
Big Muddy (5-30-41) $1.08
Lance Creek (9-1-41) 1.12

Montana

Continental Oil Co., 4-1-41:
Cat Creek $1.15

Colorado

Stanolind Oil & Gas Co., 5-20-41:
Iles $1.07
Continental Oil Co., 5-21-41:
Canon City-Florence $1.05

TEXAS GULF COAST GRAVITY TABLES

	(1)	(2)	(3)	(4)	(5)
Below 20	$1.06	$1.06	....	$.98	$.93
20-20.9	1.08	1.08	....	1.00	.95
Below 21	....	....	$1.06	....	....
21-21.9	1.10	1.10	1.10	1.02	.97
22-22.9	1.12	1.12	1.12	1.04	.99
23-23.9	1.14	1.14	1.14	1.06	1.01
24-24.9	1.16	1.16	1.16	1.08	1.03
25-25.9	1.18	1.18	1.18	1.10	1.05
26-26.9	1.20	1.20	1.20	1.12	1.07
27-27.9	1.22	1.22	1.22	1.14	1.09
28-28.9	1.24	1.24	1.24	1.16	1.11
29-29.9	1.26	1.26	1.26	1.18	1.13
30-30.9	1.28	1.28	1.28	1.20	1.15
31-31.9	1.30	1.30	1.30	1.22	1.17
32-32.9	1.32	1.32	1.32	1.24	1.19
33-33.9	1.34	1.34	1.34	1.26	1.21
34-34.9	1.36	1.36	1.36	1.28	1.23
35-35.9	1.38	....	1.38	1.30	1.25
36-36.9	1.40	....	1.40	1.32	1.27
37-37.9	1.42	....	1.42	1.34	1.29
38-38.9	1.44	....	1.44	1.36	1.31
39-39.9	1.46	....	1.46	1.38	1.33
40 and above	1.48	....	1.48	1.40	1.35

TEXAS GULF COAST GRAVITY TABLE EXPLANATION

COLUMN (1):
Humble Oil & Refining Co., 5-21-41, includes Amelia, Clear Lake, Goose Creek, Hastings, Magnet, Mykawa (new), Raccoon Bend, South Thompsons Sugarland, Thompson, and Webster fields.
Stanolind Oil & Gas Co., 5-21-41, includes West Beaumont, High Island, and Spindletop.
Sinclair Prairie Oil Marketing Co., 5-21-41.
Stanolind Oil Purchasing Co., 4-9-42, includes Clinton and Lake Creek.
Pure Oil Co., 4-21-41, includes Louise and Ganado.
Gulf Refining Co., 5-21-41, includes Spindletop, Sour Lake, Lovells Lake,

West Beaumont, Goose Creek, South Liberty, Big Creek, Blue Ridge, Fannett, Moore, Barbers Hill, Hankamer, Thompson, Lochridge, Dyersdale, and Hull (old).

Sun Oil Co., 5-21-41, includes Barbers Hill, Batson (old), Bayou Blue, Chacahoula, Cotton Lake, Esperson (below 35° gravity), Fausse Point, Goose Creek, Greens Lake, Hackberry (east and west), Hull (below 25°), Humble (below 35°), Nome, North Dayton (below 25°), Orange, Saratoga, Sour Lake, South Liberty, and Vinton.

COLUMN (2):
Texas Co., 5-21-41, includes Arriola, Ganado, Hamman, Hillje, Humble, Kubela, Magnet, Manvel, Markham, Mauritz, Old Ocean, Pickett Ridge, Port Neches, Sour Lake, West Columbia, and Withers.

COLUMN (3):
Pan American Production Co., 5-21-41 includes Hastings and South Houston.

Stanolind Oil & Gas Co., 4-1-41, includes High Island, Spindletop, Hastings, and South Houston.

COLUMN (4):
Humble Oil & Refining Co., 5-21-41, includes Anahuac, Angleton, Cedar Point, Fishers' Reef, Hull (new and old), Pierce Junction, Red Fish Reef, and Turtle Bay.

Gulf Refining Co., 5-21-41, includes Anahuac, Hull (new), Thompson (deep), Pierce Junction, and Orange.

Sun Oil Co., 5-21-41, includes Anahuac, Caplen and Turtle Bay.

Humble Oil & Refining Co., 3-29-41, includes Dickinson, Gillock, Hardin, League City, and Rowan.

COLUMN (5):
Pan American Production Co., 5-21-41, includes Gillock, except scale starts at 95 cents below 21°.

Stanolind Oil Purchasing Co., 5-21-41, includes Fairbanks, North Houston, and Roslyn.

SOUTH TEXAS AND SOUTHWEST TEXAS GRAVITY TABLES

	1	2	3	4	5	6	7
Below 20	$1.03	$1.08	$1.08	$.89	$1.03	$1.03	$1.08
20-20.9	1.05	1.10	1.10	.90	1.05	1.05	1.10
21-21.9	1.07	1.12	1.12	.91	1.07	1.07	1.12
22-22.9	1.09	1.14	1.14	.92	1.09	1.09	1.14
23-23.9	1.11	1.16	1.16	.93	1.11	1.11	1.16
24-24.9	1.13	1.18	1.18	.94	1.13	1.13	1.18
25-25.9	1.15	1.20	1.20	.95	1.15	1.15	1.20
26-26.9	1.17	1.22	1.22	.96	1.17	1.17	1.22
27-27.9	1.19	1.24	1.24	.97	....	1.19	1.24
28-28.9	1.21	1.26	1.26	.98	....	1.21	1.26
29-29.9	1.23	1.28	....	.99	....	....	1.28
30-30.9	1.25	1.30	....	1.00	....	....	1.30
31-31.9	1.27	1.32	....	1.01	....	....	1.32
32-32.9	1.29	1.34	....	1.02	....	....	1.34
33-33.9	1.31	1.36	....	1.03	....	....	1.36
34-34.9	1.33	1.38	....	1.04	....	....	1.38
35-35.9	1.35	1.40	....	1.05	....	....	1.40
36-36.9	1.37	1.42	....	1.06	....	....	....
37-37.9	1.39	1.44	....	1.07	....	....	....
38-38.9	1.41	1.46	....	1.08	....	....	....
39-39.9	1.43	1.48	....	1.09	....	....	....
40 and above	1.45	1.50	....	1.10	....	....	....

SOUTH AND SOUTHWEST TEXAS TABLE EXPLANATION

COLUMN (1) MIRANDO:
Humble Oil & Refining Co., 5-21-41, includes Blanchard Bridwell, Colorado, Comitas, Eagle Hill, Escobas, Fitzsimmons, Glen, Government Wells (North and South), Heyser, Hoffman, Kelsey, Kohler, Loma Novia, Lundell, Manila, Mirando Valley, Placedo, Randado, Sarnosa, and Tesoro.

Magnolia Petroleum Co., 5-21-41.

Continental Oil Co., 7-1-41. Includes Hoffman, Government Wells (North and South), Lopez, Moco, Colmena, Seven Sisters, South Seven Sisters, Loma Novia, Conoco Driscoll, O'Hern, Piedre Lumbre, and Taranchauas.

American Mineral Spirits Co., 5-21-41, includes Adami and Munson.

Republic Oil Refining Co., 5-21-41, includes Heyser field crude.

COLUMN (2) REFUGIO:
Continental Oil Co., 7-1-41, includes Minnie Bock, Clara Driscoll, South Clara Driscoll, Driscoll Ranch, Orange Grove, and Wade City.

Humble Oil & Refining Co., 5-21-41, includes East White Point, Greta, Melon Creek, O'Connor-McFaddin, Plymouth, Saxet, Taft, and Tom O'Connor.

American Mineral Spirits Co., 5-21-41, includes Plymouth, Taft, and East White Point.

COLUMN (3) REFUGIO:
Texas Co., 5-21-41, includes Greta, Saxet, and Taft.

COLUMN (4) LA ROSA:
American Mineral Spirits Co., 3-29-41.

COLUMN (5) DUVAL-MIRANDO:
Sun Oil Co., 5-21-41.

COLUMN (6) DUVAL-MIRANDO:
Texas Co., 5-21-41.

COLUMN (7) NUECES COUNTY:
American Mineral Spirits Co., 5-21-41.
Republic Oil Refining Co., 5-21-41.

WEST TEXAS, PANHANDLE AND NEW MEXICO TABLE EXPLANATION

COLUMN (1):
Humble Oil & Refining Co., 5-21-41, includes Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler, and Yoakum counties, West Texas, and Lea County, New Mexico.

Gulf Refining Co., 5-21-41, includes Crane, Ector, Upton, Ward, and Winkler counties, West Texas.

COLUMN (2):
Sinclair Prairie Oil Marketing Co., 5-21-41, includes West Texas and Lea County, New Mexico. Effective 5-29-41 in Eddy County, New Mexico.

Magnolia Petroleum Co., 5-21-41, includes Upton, Howard, Glasscock, Mitchell, Winkler, Cochran, Hockley, Yoakum, and Gaines counties.

COLUMN (3):
Texas Co., 5-21-41, includes Crane and Winkler counties, Texas, and Lea County, New Mexico.

COLUMN (4) TEXAS PANHANDLE:
Magnolia Petroleum Co., 7-9-41.
Continental Oil Co., 7-9-41.
Phillips Petroleum Co., 7-9-41.

COLUMN (5) WINKLER AND LEA:
Stanolind Oil & Gas Co., 5-21-41, includes Winkler County only.
Gulf Refining Co., 5-21-41, includes Lea County, New Mexico, only

COLUMN (6) GRAY COUNTY:
Texas Co., 5-21-41.
H. F. Wilcox Oil & Gas Co., 7-9-41.

COLUMN (7) LEA COUNTY:
Magnolia Petroleum Co., 5-21-41.

COLUMN (8) EDDY COUNTY:
Continental Oil Co., 5-30-41.

COLUMN (9):
Shell Oil Co., Inc., 5-20-41, includes Crane, Ector, Howard, Glasscock, Upton, Winkler, and Yoakum counties, Texas, and Lea County, New Mexico.

COLUMN (10) TEXAS PANHANDLE:
Humble Oil & Refining Co., 7-9-41.

COLUMN (11) PANHANDLE:
Sinclair Prairie Oil Marketing Co., 5-23-41.

WEST TEXAS, PANHANDLE, AND NEW MEXICO GRAVITY TABLES

	1	2	3	4	5	6	7	8	9	10	11
Below 20	$0.70	....	....	....	....	....	....	....	$0.70	$0.73	....
20-20.9	.72	....	....	....	....	....	....	....	.72	.75	....
21-21.9	.74	....	....	....	....	....	....	....	.74	.77	....
22-22.9	.76	....	....	....	....	....	....	....	.76	.79	....
23-23.9	.78	....	$0.78	....	....	....	....	....	.78	.81	....
24-24.9	.80	....	.80	....	....	....	....	....	.80	.83	....
Below 25	....	$0.80	....	....	....	....	....	$0.80	....	....	$0.83
25-25.9	.82	.82	.82	....	$0.82	....	.82	....	.82	.85	.85
26-26.9	.84	.84	.84	....	.84	....	.84	....	.84	.87	.87
27-27.7	.86	.86	.86	....	.86	....	.86	....	.86	.89	.89
28-28.9	.88	.88	.88	$0.91	.88	....	.88	$0.88	.88	.91	.91
29-29.9	.90	.90	.90	.93	.90	....	.90	.90	.90	.93	.93
30-30.9	.92	.92	.92	.95	.92	....	.92	.92	.92	.95	.95
31-31.9	.94	.94	.94	.97	.94	....	.94	.94	.94	.97	.97
32-32.9	.96	.96	.96	.99	.96	....	.96	.96	.96	.99	.99
33-33.9	.98	.98	.98	1.01	.98	....	.98	.98	.98	1.01	1.01
34-34.9	1.00	1.00	1.00	1.03	1.00	$1.03	1.00	1.00	1.00	1.03	1.03
35-35.9	1.02	1.02	1.02	1.05	1.02	1.05	1.02	1.02	1.02	1.05	1.05
36-36.9	1.04	1.04	1.04	1.07	1.04	1.07	1.04	1.04	1.04	1.07	1.07
37-37.9	1.06	1.06	....	1.09	1.06	1.09	....	1.06	....	1.09	1.09
38-38.9	1.08	1.08	....	1.11	1.08	1.11	....	1.08	....	1.11	1.11
39-39.9	1.10	1.10	....	1.13	1.10	1.13	....	1.10	....	1.13	1.13
40 and above	1.12	1.12	....	1.15	1.12	1.15	....	1.12	....	1.15	1.15

NORTH TEXAS, WEST CENTRAL TEXAS, EAST CENTRAL TEXAS GRAVITY TABLES

	1	2	3	4	5	6	7	8
Below 20	....	....	....	....	$.80	....	....	....
20-20.9	....	....	....	....	.82	....	....	....
Below 21	....	....	....	....	....	$.81	....	....
21-21.9	....	....	....	....	.84	.83	....	....
22-22.9	....	....	....	....	.86	.85	....	....
23-23.9	....	....	....	....	.88	.87	....	....
24-24.9	....	....	....	....	.90	.89	....	....
Below 25	....	....	$.88	....	....	....	$.89	$.95
25-25.9	$.91	....	.90	$.97	.92	.91	.91	.97
26-26.9	.93	....	.92	.99	....	.93	.93	.99
27-27.9	.95	....	.94	1.01	....	.95	.95	1.01
28-28.9	.97	.97	.96	1.03	....	.97	.97	1.03
29-29.9	.99	.99	.98	1.05	....	.99	.99	1.05
30-30.9	1.01	1.01	1.00	1.07	....	1.01	1.01	1.07
31-31.9	1.03	1.03	1.02	1.09	....	1.03	1.03	1.09
32-32.9	1.05	1.05	1.04	1.11	....	1.05	1.05	1.11
33-33.9	1.07	1.07	1.06	1.13	....	1.07	1.07	1.13
34-34.9	1.09	1.09	1.08	1.15	....	1.09	1.09	1.15
35-35.9	1.11	1.11	1.10	1.17	....	1.11	1.11	1.17
36-36.9	1.13	1.13	1.12	1.19	....	1.13	1.13	1.19
37-37.9	1.15	1.15	1.14	1.21	....	1.15	1.15	1.21
38-38.9	1.17	1.17	1.16	1.23	....	1.17	1.17	1.23
39-39.9	1.19	1.19	1.18	1.25	....	1.19	1.19	1.25
40 and above	1.21	1.21	1.20	1.27	....	1.21	1.21	1.27

NORTH TEXAS, WEST CENTRAL TEXAS, EAST CENTRAL TEXAS TABLE EXPLANATION

COLUMN (1) WEST CENTRAL AND NORTH:
Humble Oil & Refining Co., 12-11-41, includes Brown, Callahan, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, and Throckmorton counties.

Panhandle Refining Co., 12-11-41, in Leuders area.

Gulf Refining Co., 12-11-41.

Sinclair Prairie Oil Marketing Co., 12-11-41.

COLUMN (2) NORTH TEXAS:
Continental Oil Co., 12-11-41.
Magnolia Petroleum Co., 12-11-41.
Panhandle Refining Co., 12-11-41.
Hell Oil & Gas Co., 12-11-41.
Texas Co., 12-11-41.

COLUMN (3) EAST CENTRAL:
Magnolia Petroleum Co., 5-21-41, includes Cass, Panola, and Rodessa (Texas and Louisiana), and Miller County, Arkansas.

(Continued on Page 99)

STANDARD OIL CO. OF CALIFORNIA

CRUDE-OIL PRICES EFFECTIVE MAY 23, 1941

(All gravities above those quoted take highest price offered in that field)

Gravity	Signal Hill (Long Beach)	Wilmington	El Segundo	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canyon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley, Canal, Wasco	Coles Levee	Mountain View	Elk Hills, Buena Vista Hills, Midway-Sunset, Lakeview area	Lost Hills	Coalinga	Wheeler Ridge	Kettleman Hills	Elwood Terrace
14-14.9	....	$.68	....	....	$.71	....	....	$.70	....	$.70	$.70	$.70	$.72	....	....	....	....	....	$.73	$.73	$.73	....	....	....
15-15.9	....	.71	....	....	.75	$.76	....	.72	....	.72	.71	.72	.72	....	....	....	....	....	.73	.73	.73	....	....	....
16-16.9	....	.74	$.79	....	.79	.79	....	.75	....	.74	.73	.75	.72	....	....	....	....	....	.73	.73	.73	....	....	....
17-17.9	....	.78	.82	....	.82	.82	....	.78	....	.77	.76	.78	.72	....	....	....	....	....	.75	.75	.73	....	....	....
18-18.9	$.80	.82	.86	....	.86	.85	....	.81	....	.80	.79	.82	.74	....	....	....	....	....	.78	.81	.73	....	....	....
19-19.9	.84	.86	.90	....	.89	.88	....	.85	....	.83	.82	.85	.77	....	....	....	....	$.73	.81	.84	.75	....	....	....
20-20.9	.88	.90	.94	....	.93	.92	$.80	.88	....	.86	.85	.89	.80	....	....	....	....	.76	.85	.87	.77	....	....	....
21-21.9	.92	.94	.98	....	.96	.95	.84	.91	....	.89	.89	.92	.84	....	....	....	....	.79	.90	.90	.80	....	....	....
22-22.9	.96	.98	1.02	$.88	.99	.98	.87	.95	....	.93	.93	.96	.87	....	....	....	....	.83	.94	.93	.83	$.76	....	....
23-23.9	1.00	1.02	1.06	.92	1.02	1.01	....	.98	....	.97	.98	1.00	.91	....	....	....	....	.87	.99	.96	.86	.80	....	....
24-24.9	1.03	1.06	1.07	.97	1.05	1.04	f.o.b.	1.01	....	1.01	1.02	1.03	.94	$.99	....	....	....	.90	1.03	.99	.89	.83	....	....
25-25.9	1.07	1.09	1.10	1.01	1.08	1.07	our	1.04	....	1.05	1.06	1.07	.98	1.02	....	....	....	.94	1.07	1.01	.92	....	....	....
26-26.9	1.11	1.12	1.12	1.06	1.11	1.10	pipe	1.08	....	1.09	1.10	1.11	1.01	1.06	....	....	....	.97	1.11	1.04	.95	....	....	....
27-27.9	1.15	1.15	1.16	1.10	1.14	1.14	line	1.11	....	1.13	....	1.15	1.05	1.10	$1.04	....	....	1.01	1.15	1.07	.98	....	....	....
28-28.9	1.18	1.18	1.18	1.15	1.17	1.17	....	1.14	....	1.17	....	....	1.08	1.13	1.08	....	....	1.04	1.19	1.10	1.00	....	....	....
29-29.9	1.20	1.21	....	1.19	1.20	1.20	....	....	$1.17	....	....	....	1.12	1.17	1.12	....	....	1.07	1.24	1.13	1.02	....	....	....
30-30.9	1.23	1.24	....	....	1.23	1.22	....	....	1.21	....	....	....	1.15	1.21	1.15	$1.01	$1.09	1.10	1.28	1.16	1.04	....	....	f.o.b.
31-31.9	....	....	....	....	....	1.24	....	....	1.25	....	....	....	1.19	1.24	1.19	1.04	1.12	1.14	....	....	1.06	....	....	ship
32-32.9	....	....	....	....	....	....	....	....	1.29	....	....	....	1.23	1.28	1.23	1.07	1.14	1.17	....	....	1.09	....	....	....
33-33.9	....	....	....	....	....	....	....	....	1.32	....	....	....	1.27	....	1.26	1.10	1.17	....	....	....	1.11	....	....	$1.22
34-34.9	....	....	....	....	....	....	....	....	1.36	....	....	....	1.31	....	1.30	1.13	1.20	....	....	....	1.13	....	....	1.25
35-35.9	....	....	....	....	....	....	....	....	....	....	....	....	1.35	....	....	1.16	1.22	....	....	....	....	....	$1.23	1.28
36-36.9	....	....	....	....	....	....	....	....	....	....	....	....	1.39	....	....	1.19	1.25	....	....	....	....	....	1.26	....
37-37.9	....	....	....	....	....	....	....	....	....	....	....	....	1.43	....	....	1.22	....	....	....	....	....	....	1.29	....
38-38.9	....	....	....	....	....	....	....	....	....	....	....	....	1.47	....	....	1.25	....	....	....	....	....	....	....	....
39-39.9	....	....	....	....	....	....	....	....	....	....	....	....	1.51	....	....	....	....	....	....	....	....	....	....	....
40-40.9	....	....	....	....	....	....	....	....	....	....	....	....	1.53	....	....	....	....	....	....	....	....	....	....	....

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Professor of Geology, Columbia University
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CHAPTERS

1. Introduction
2. Rocks and Structures
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20. Meteor Craters

Book Department
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

Among the Drilling

HOUSTON Drilling Co., Houston, Tex., extended production in the Harmon field, Jackson County, Texas, approximately 1,300 ft. east with the completion of Gulfboard 1-C Harmon, in sand at 5,355-5,408 ft.

OLSON Drilling Co. has been awarded contract for Ohio Oil Co. 3 Harry C. Grow, NE NE SW 35-22n-2e, Ogemaw County, Michigan. Pits already are dug waiting on the contractor to move a rotary from a location in the Reed City field. The Richfield will be the test's primary objective.

J. C. POOLE is expected to let contract in the near future for a 6,200-ft. wildcat located in the La Hurta grant, Duval County, Texas.

LONGHORN Drilling Co., San Antonio, Tex., received contract from Ogden & Boyle for 1 M. I. Richardson, a projected 5,500-ft. wildcat located 3 miles south of the Kohler field, Duval County, Texas. Location is in the G.B.&C.N.C. Survey 3.

PARKER Drilling Co. has been awarded contract for Continental 1 Fred C. Radee, C NW SW 14-3s-4w, Calhoun County, Michigan.

R. E. KENNEDY, Kilgore, Tex., drilling contractor, has been given the contract for British American 1 C. Abell, 1,600 ft. from north and 900 ft. from west lines of 100-acre tract in the Richard Hooper Survey. Location is for a 3,000-ft. wildcat 1½ miles southwest of Hallsville in western Harrison County, Texas, on a block of 1,500 acres. The wildcat will seek production from the Blossom sand. Contract calls for completion by September 20.

H. B. BURDEN, Kilgore, Tex., has the contract for the Ira McMahon, W. F. Stelzer and Knud Brum, of Houston, Tex., 1 May Winniford, a new Woodbine-Paluxy sand wildcat test in Hunt County, Texas, east of the Club Lake pool, and 1 mile south of the town of Campbell. Location is 600 ft. from east and north lines of a 45-acre tract in the J. McKinley Survey. Contractor will move in immediately.

BUTLER & HORNE Drilling Co., Dallas, Tex., is planning an immediate drill program for its new discovery area in Taylor County, Texas, as last week two offset locations were announced. The 1 W. H. Frazier is 330 ft. out from the southeast corner of 26-17-T.&P., west of the opener, and the 1 Hudson is 780 ft. from the west and 519 ft. from the north lines of the farm in the J. H. Nabors Survey, south of the opener.

CARL B. KING Drilling Co. has contract for drilling Ohio Oil Co. 1 State-Don McCormick, a wildcat in extreme northeastern Lea County, New Mexico, which topped solid lime at 4,220 ft. and was drilling below 4,475 ft. in lime. The test is 660 ft. out on the NE 36-9s-37e.

PENROD Drilling Co. has the contract for Placid Oil Co. 1 Moffett, NE 27-7n-3e, in the Nebo-Hemphill area, La Salle Parish, Louisiana. The contract calls for a 4,000-ft. Wilcox test.

INGLING & PARKER Drilling Co. has contract for J. W. Dutton et al 1 Bristol, NW SW 9-1n-2e, north of Davis in Murray County, Oklahoma. Work was started last week end.

JOCK GARDEN, drilling contractor of Hutchinson, Kans., will use a big rig to drill a wildcat test for Cities Service 1 Glenn Gray, in SW cor. 29-65n-39w, 3 miles southeast of Tarkio, Atchison County, the most northwesterly area in Missouri. The test is on a block of acreage Cities Service acquired when it absorbed Indian Territory Illuminating Oil Co.

CROWE Drilling Co., Shreveport, La., received contract for a 9,000-ft. wildcat from the Texas Co. The well is 1 W. G. Straghan located east of the town of Swift in eastern Nacogdoches County, Texas.

FAIN Drilling Co., Houston, Tex., was scheduled to core for the Wilcox sand in the company's 1 Baldwin, a wildcat located 3½ miles west of the Mercy field, San Jacinto County, Texas. Five other operations are reported in Matagorda, Starr and Victoria counties for Continental Oil Co. and Union Producing Co.

GRAY & WOLFE, Houston, Tex., are coring for the Wilcox sand in La Gloria Corp. 1 Grogan-Cochran Lumber Co., a semiwildcat located west of the Lake Creek field, Montgomery County, Texas.

BREWSTER-BARTLE Drilling Co., Houston, Tex., was preparing to test George W. Strake 1 Florence & Parker, an outpost well in the Aldine area, Harris County, Texas. Total depth is 8,005 ft., with casing cemented at 6,645 ft. Possible produc-

From every corner of the land, Americans are urged to purchase the stamps and bonds that help finance the war. Here the admonition greets oil workers on a rig at an Oklahoma location

Contractors

tion was indicated in the Cockfield sand at 6,595-6,612 ft. Another rotary is located in the Willis area, Montgomery County, Texas, for the same operator, while a third operation is reported for Ohio Oil Co., in the new North Bay City field, Matagorda County, Texas.

PETROLEUM WELL Service Co. was scheduled to start two new wells in the Stewart field, Jackson County, Texas, for W. S. Boyle, following the completion of two wells which marked up important extensions northeast and southwest of the discovery well.

●

Priority Pattern Is Arranged to Insure War Plants Materials

WASHINGTON, D. C.—A new over-all program for controlling the flow of materials during the fourth quarter of this year to assure deliveries on schedule to vital war plants was announced recently by Amory Houghton, director general for operations.

Basis of the plan is an entirely new method of handling Production Requirements Plan applications to keep the supply of materials in balance with needs of the most essential war industries.

The program for the fourth quarter is divided as follows:

1. The bulk of applications were received by the August 10 deadline. Nearly 23,000 fourth-quarter applications have now been received.

2. Each application is acknowledged as it is received. The applicant is notified of the serial number of his case and the branch to which it will be sent for processing.

3. One copy of each application is sent to the Bureau of Census, where the indicated total materials requirements will be tabulated in terms of over 200 end-product classifications.

4. Another copy of the application is sent to the branch responsible for processing it, where a tabulation of materials requirements of all industries and companies assigned to that branch will be made.

5. Both the Bureau of Census and the various industry branch tabulations will be submitted to the requirements committee, together with reports on prospective supplies for the quarter from the materials branches. The chairman of the requirements committee will determine the general pattern of materials distribution, both in terms of the 223 end products and in accordance with the companies assigned to the various branches, after setting aside a "kitty" for contingencies, readjustments, and for the use of smaller companies not under PRP.

6. These determinations will then go to the various industry branches, which will process the individual applications in accordance with the amounts of materials which may be authorized for each end product.

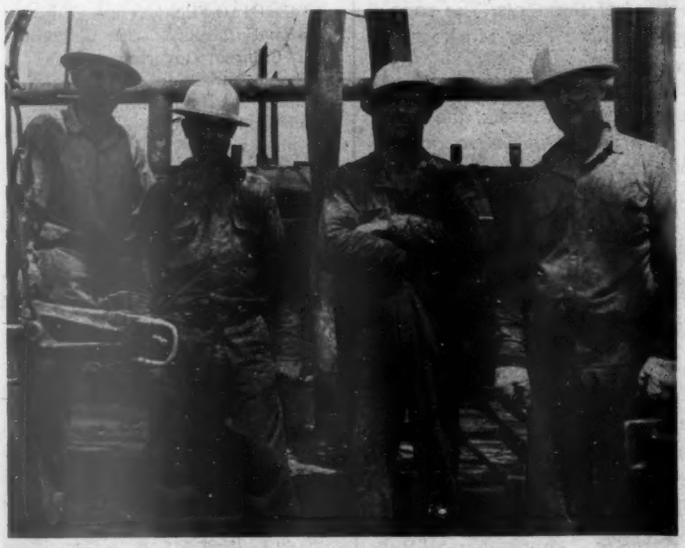
7. All processed applications, before being sent back to the applicants as approved PRP certificates, will be checked by a review and approval section.

8. A copy of each PRP certificate authorizing receipt of scarce materials, or a report giving the same information, will be sent to each of the materials branches responsible for month-to-month allocations of the scarcest materials. On the basis of these authorizations, and of individual reports as required by the various "M" orders, the materials branches will fit the authorized deliveries of materials into the delivery schedules of primary materials producers.

9. Fourth-quarter applicants under PRP have been authorized by a recent amendment to Priorities Regulation 11 to place orders for fourth-quarter delivery in anticipation of receiving their PRP certificates. As soon as the certificates are received, they must make any necessary adjustments in these purchase orders to bring them into line with the authorizations, in order to receive not more than 40 per cent of the total authorized amount in October, an additional 30 per cent in November, and the remainder in December.

10. Careful checks will be made, company by company, to see that all materials authorized and received are actually put into production in the fourth quarter, or used to maintain a practicable working minimum inventory.

11. Materials in the "kitty" will be delivered on preference ratings assigned by P orders, PD-1A and PD-3A certificates, project ratings, and on interim applications under PRP. An account of such authorization will also be kept so that preference ratings will not be assigned to a greater volume of materials than is available.



Crew of Arrow Drilling Co., of Okemah, Okla. The men are A. B. Hill, driller; Andy Kennon, motorman; R. L. Fain, derrickman, and Lee Braughton, pipe racker

●

A.P.I. Issues Revised Drilling-Fluid Code

A revised second edition of its code of recommended practice of standard field procedure for testing drilling fluids has been issued by the American Petroleum Institute, Division of Production.

Copies of the revised edition, A.P.I. Code 29: "Recommended Practice on Standard Field Procedure for Testing Drilling Fluid (Tentative)," may be obtained from the Institute at New York or 120 Continental Building, Dallas, Tex. Price is 50 cents.

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Personal Paragraphs

J. E. BRANTLY, international oil man and president of Drilling & Exploration Co., Dallas, Tex., left Dallas last week for Rio de Janeiro, Brazil, where he will be in charge of a number of rigs which the company is operating under an agreement with the Brazilian Government. Mr. Brantly expects to stay in Brazil for several weeks, and may establish permanent offices there after the first of the year.

H. D. CRISLIP, engineer for Gulf Oil Corp., has been transferred from Tulsa to El Dorado, Ark.

E. B. REESER, president, Barnsdall Oil Co., returned to Tulsa this week after spending several months in New York and New England.

LEE CORNELIUS, of Gulf Oil Corp. at Midland, Tex., has been elected secretary-treasurer of the West Texas Oil Scouts Association.

F. M. BANKS, vice president of Southern California Gas Co., has been named for president of the Pacific Coast Gas Association during 1943.

FLOYD A. CALVERT, of Saginaw, Mich., Michigan attorney for Pure Oil Co., has been elected chairman of the Mineral Law Section of the American Bar Association.

R. J. LOWE, assistant purchasing agent for Pure Oil Co. at Tulsa, left last week for Miami Beach, Fla., with a commission as first lieutenant in the Army Air Corps. Later he will go to Mobile, Ala.

J. E. SLEMP, president, Gibson Oil Corp., Amarillo, Tex., has received his orders to report to San Francisco, Calif., October 5. He has been commissioned lieutenant junior grade in the Navy.

EARL MARSH, who has been in the general office engineering department of Southern Counties Gas Co., Los Angeles, Calif., since 1939, has left to begin work with the Fluor Corp., in Los Angeles.

E. H. VAN PATTEN, independent operator of Oklahoma City, Okla., has sold his one-fourth interest in the shallow field west of the Francis pool in Pontotoc County, Oklahoma. He has been commissioned a captain in the Army and is now on duty.

LLOYD BAYLY, General Petroleum Corp., Los Angeles, Calif., has been appointed resident manager for the company in the marketing field for southern California, Arizona and southern Nevada. Mr. Bayly, who recently completed his seventeenth year with General Petroleum, return to the home office in Los Angeles from Seattle, Wash., where he was resigent manager of the marketing division.

WILLIAM J. HALEY has been appointed to direct operations of all the foreign refineries of Standard Oil Co. (New Jersey) interests. He succeeds G. W. GORDON, who has been relieved of active responsibility on the completion of 40 years of service. Mr. Haley is a graduate of University of Pennsylvania, and joined Standard in 1914. He became mechanical superintendent at Baton Rouge, La., after World War I, and subsequently managed a refinery at Havana, Cuba. Later he was made assistant general manager of foreign refineries. Mr. Gordon will continue with the company in a consulting capacity. His associates in the department presented him with a large silver tray at a reception upon announcement of his retiring from active duty.

W. J. HALEY

G. W. GORDON

JOHN RUWWE, formerly a geologist at Shawnee, Okla., and then at Bartlesville, Okla., for Phillips Petroleum Co., is now an ensign in the Navy.

PAUL M. BROWN, president and general manager of Bayou State Oil Co., Shreveport, La., has been appointed chairman of Caddo Parish, Louisiana draft board No. 3, succeeding Prentiss E. Furlow, who resigned.

L. F. WILLHITE and F. J. BHAER have been transferred from the Findlay, Ohio, offices of Ohio Oil Co. to Mount Pleasant, Mich., where they have been assigned duties in the producing division of the company.

YU-CHIAO-TUNG, representing the National Resource Commission of the Chinese Government, was in Tulsa last week in connection with a study he is making of the oil industry in the United States in all its phases.

J. R. MULVEY, chief accountant of Humble Oil & Refining Co., Houston, Tex., has been appointed assistant comptroller of the company. Mr. Mulvey joined Humble in 1918 and was made chief accountant of the sales department in 1932.

REESE H. TAYLOR, president of Union Oil Co. is expected home shortly following his resignation from the staff of the War Production Board, which was accepted by Donald Nelson. Union Oil Co. executives will welcome him home as they have been working short-handed since Mr. Taylor's departure for Washington to determine if he could unsnarl the steel situation.

Do You Remember?

From The Oil and Gas Journal Files

40 YEARS AGO

Carelessness on the part of a watchman who carried a lighted lantern in his hands while making an inspection of a wooden settling tank is given as the cause of a disastrous fire which visited Spindletop Hill last week, raging for 2 days and consuming $100,000 worth of oil, machinery, and equipment.

The 375-ft. well of the Sour Lake Oil Co. has been brought in a good producer. This is believed to be the shallowest gusher in the southern field. It is estimated it will make from 5,000 to 10,000 bbl. in 24 hours.

The charter of the Union Refining Co. has been filed for record at Lake Charles, La. The company has $50,000 capital. S. H. Brown, one-time Standard Oil employe, has been retained as the company's chemist.

25 YEARS AGO

Glenn T. Braden, Tulsa gas man, has donated sufficient gas to fill the national balloon-race requirements. The race is to be a feature of the Muskogee State Fair, Muskogee, Okla.

To guarantee ample fuel for Army and Navy needs and for the legitimate requirements of motor-car users, the national automobile organization has begun its "save gasoline" campaign among garages, dealers, and owners.

Crude oil in the Elk Basin and Grass Creek fields of Wyoming, have been advanced in price to $1.70 per barrel, and in the Big Muddy fields to $1.15 per barrel.

10 YEARS AGO

Silas Richard Parsons, chairman of the board of directors of British-American Oil Co., and for many years an outstanding figure in the Canadian refining industry, died last week in his seventy-ninth year.

Walter C. Teagle, president of Standard Oil Co. (New Jersey), has taken a leave of absence temporarily from the oil industry to devote his time and energy to the reemployment campaign. He has been appointed to head the "share-the-work" movement endorsed by President Hoover's Economic Conference.

JOHN FERTIG CHURCH, with Kewanee Oil Co. at Shidler, Okla., has been commissioned an ensign in the Navy, and has been ordered to active duty at Norfolk, Va.

RUSSELL V. JOHNSON, consulting geologist, Calgary, Alta., is spending a month in Montreal and the Gaspe Peninsula in connection with a projected oil development.

OWENS STEPHENS, formerly of Sunray Oil Co., Tulsa, is now in the Navy, and is stationed at Norfolk, Va. RUHL LOONEY, also with Sunray at Tulsa, has a civil-service job in the shipyards at Charleston, S. C.

GEORGE R. JOHNSON, assistant district landman for Sinclair Prairie Oil Co., has been transferred from Kansas to Tyler, Tex., and made head of the district. He has been in Kansas for 7 years.

JERRY SADLER, member of the Texas Railroad Commission, last week married Miss Laura Jones, of Austin, Tex. Mr. Sadler resigned from the commission to join the Army, but later withdrew his resignation.

GEORGE JAY SMITH, who has been connected with R. & G. Drilling Co., Wichita Falls, Tex., has been commissioned a first lieutenant in the Army Air Force, and has left for Miami Beach, Fla., where he will receive training.

MAJ. A. N. HORNE, vice president and general superintendent, War Emergency Pipelines, Inc., left the company's Little Rock, Ark., headquarters last week to attend the funeral of his father at Morton, Miss., who died at the age of 72 a month after he retired from his sawmill activities.

In charge of the Texas district office of Elm Oil Co. in Dallas, Tex., is NEVA D. HABY, who is taking over for her husband, ROY L. HABY, enlisted in the U. S. Army Air Force and stationed at Sheppard Field. Mrs. Haby has also taken over her husband's position as vice president of the Chestnut Securities Co.

Long Effort Rewarded

Bryan W. Payne, president of the Iowa-Payne Oil Co., Tyler, Tex., and president of the East Texas Salt Water Disposal Co., can justifiably accept much of the credit for successful organization of the joint major company-independent operator conservation project in the East Texas field. Recently, the disposal company increased its capitalization to $2,000,000 which, sponsors believe, is adequate for operating on a basis of returning 400,000 bbl. of water daily to the lower Woodbine sand. Increased oil recovery of 200 to 600 million barrels is anticipated by engineers and, in addition, the flowing life of properties will be materially extended.

BRYAN W. PAYNE

Mr. Payne has been active in the oil industry since conclusion of World War 1. He went to work on tools at Burkburnett, Tex., after being mustered out of the Army air service and remained in North Texas, drilling in various fields. In 1925, Mr. Payne drilled the discovery well at Echo north of Coleman, Tex., for Burke-Greis and Gwinnup which was followed by an active drilling play in nearby Texas counties in which he participated as an operator and contractor.

Mr. Payne moved to East Texas shortly after the Joiner discovery well was completed near Henderson and acquired several leases, the drilling and production of which have engaged his time for the past 12 years.

Conservation of natural resources by elimination of all possible physical waste has become practically a creed with Mr. Payne. He has devoted many months out of the past several years to preaching the doctrine of conservation.

Mr. Payne was president of the East Texas Lease and Royalty Owners Association during the early thirties. He was vice president for Texas from 1935-38 of the Independent Petroleum Association of America, and served the Texas Mid-Continent Oil and Gas Association as vice president in 1938 and 1939.

WILLIAM A. HUDSON, president, Emperor Oil Co., Fort Worth, Tex., has joined the Ferry Command of the Army Air Corps at Hensley Field, Texas, as a civilian pilot.

R. C. HENSEL, who has been connected with the personnel department at Tulsa for Shell Oil Co., Inc., is now connected with the same department of the New York office.

M. T. SMITH, Midland, Tex., pilot and for several years crude-oil purchasing agent in the Midland territory for Shell Oil Co., Inc., has left for Hensley Field, in Texas, to enter the Army Air Forces Ferry Command.

MARION S. CHURCH, independent operator and oil attorney of Dallas, Tex., is the choice of Gov. Coke L. Stevenson of Texas for permanent chairman of the State Democratic Convention which meets at Austin, Tex., this week.

LESTER LUECKE, geologist, and LONNIE HUDDLESTON, oil scout, of Wichita Falls, Tex., have been commissioned as first and second lieutenant, respectively, in the Army and will report at Miami Beach, Fla., for training on September 16.

BOB ROOD, until recently in the land department of Champlin Refining Co., has joined Phillips Petroleum Co. and is district landman at Wichita, Kans., succeeding P. H. PIGGOTT, who is being transferred to the Oklahoma City, Okla., district.

Getting in stride at Camp Wolters, Tex., preparatory to being sent to officer's training school is JAY McKEE, son of JESSE McKEE, both of the firm of Taubert & McKee, Fort Worth, Tex., independent operators and drilling contractors.

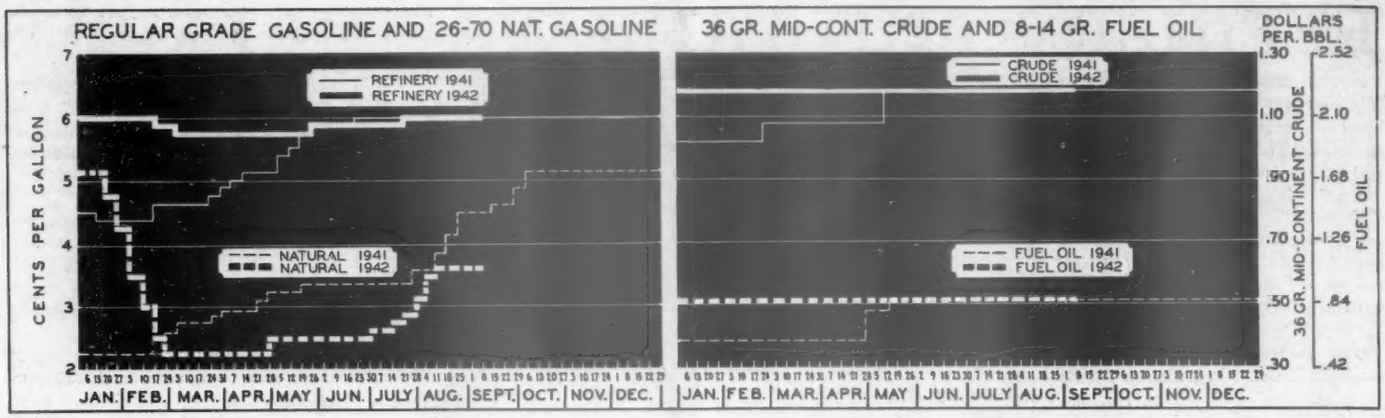
W. S. MORRIS, petroleum engineer and lawyer, has been selected as vice president and general manager of the East Texas Salt Water Disposal Corp., a $2,000,000 community project which is expected to increase ultimate recovery from the East Texas oil field by from 200 to 800 million barrels of crude oil.

JACK H. ABERNATHY, Tulsa, has resigned his position as chief petroleum engineer for Superior Oil Corp., Tulsa, to become chairman of the engineering committee of the Oklahoma City Wilcox Engineering Association, and to direct the engineering study of the field. Prior to his association with Superior, Mr. Abernathy was chief petroleum engineer for Sunray Oil Co., Tulsa, for a number of years, during which time he was actively identified with the engineering and production problems of the Oklahoma City field. He is a graduate of Oklahoma University. Mr. Abernathy succeeds ARTHUR D. SMALL, who recently resigned to accept a commission as major in the Army. CHARLES P. DIMIT, vice president in charge of production for Phillips Petroleum Co., Bartlesville, Okla., is chairman of the advisory board of the association.

Shifts: E. J. BOAS, geologist, Phillips Petroleum Co., Denver, Colo., to Mount Pleasant, Mich.; G. FLINT SAWTELLE, engineer, Humble Oil & Refining Co., Talco, to Corsicana, Tex.; RAY BODKINS, superintendent, E. G. Bradham, Magnolia, Ark., to Houston, Tex.; KENNETH B. ABSHER, Absher & Booth, Mattoon, Ill., to San Antonio, Tex.; LOUIS O. STORM, engineer, Shell Oil Co., Inc., McCamey, to Monahans, Tex.; BRUCE L. BATES, engineer, Phillips Petroleum Co., Odessa, Tex., to Fayetteville, Ark.; HENRY CARTER REA, geologist, Seaboard Oil Co., Houston, Tex., to British-American Oil Co., Calgary, Alta.

J. C. HUNTER, Abilene, Tex., president, Texas Mid-Continent Oil and Gas Association, spoke on the radio last Sunday, as one of the speakers on the Texas Forum of the Air.

ED H. MOORE, president, E. H. Moore, Inc., Tulsa, has accepted the invitation of the Republican State Central Committee of Oklahoma, to succeed the late W. B. PINE as that party's nominee for the U. S. Senate. Mr. Moore, a life-long Democrat, was a delegate to the Democratic National Convention in Chicago and then returned home to chairmanship of Wilkie-for-President movement.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK.—The inability of existing tank-car unloading facilities to handle full train loads of oil products, particularly in New England, threatens to offset some of the advantages gained by this method of shipping. Unloading racks have been enlarged to take care of the full train loads but consignees have been unable to get some equipment, particularly metal parts, and therefore have been unable to utilize the enlarged racks. It is estimated that the unloading capacity at one point could be increased 200 per cent if auxiliary equipment was available for already constructed racks.

American Petroleum Institute reports showing steady increases in stocks of light fuel oil are regarded as encouraging though these reports do not give a breakdown on location of inventories. Compared to the situation as it existed 2 months ago, the East Coast storage position is believed to be substantially better. It is believed that an abnormally large number of consumers have full stocks on hand, a factor that cannot be reliably gaged.

The possibility of reducing gasoline ration-card values was revived after the petroleum industry committee reported that motor-fuel demand continued to run in excess of desirable levels. It is generally believed that such measures will be adopted only as a last resort and that a lower ration-card value in the immediate future is highly improbable. The oil industry is reported to be noncommittal at present regarding this step since it has been difficult to analyze the effects of the permanent rationing system which may be greater than first appearances indicate.

Mid-Continent

COOLER weather this week in the more northern states of the Middle West kindled interest in fuel-oil supplies. Mid-Continent refiners reported that buyers were searching the market for additional supplies that could be purchased for prompt loading or tied up on over-the-winter commitments. Prices on kerosene and all light grades of burning oils were particularly firm.

Motor-fuel conditions were not changed noticeably this week although refiners in the Oklahoma-Kansas area are concerned about the lack of readily available supplies. Commitments have been made for eastern delivery in some instances that are in excess of current manufacturing schedules. Some refiners underestimated the depth of the Mid-Continent and Middle West gasoline market, anticipated even greater reductions in civilian consumption than have been realized and are not now in position to cover commitments for eastern shipments without diverting supplies for which there is a consumer demand in the immediate area. Some refiners are facing the necessity of covering short positions in the motor-fuel market before the year ends.

Directive 57, administered so far on the liberal side, is expected to soon become an increasingly important factor in the problem of distributing automotive fuel in the Middle West. During the first 2 weeks of the directive's effectiveness, the District 2 OPC granted exceptions at the rate of nearly 400 tank cars per day. OPC has indicated that future applications for exemptions will be given more rigid scrutiny and that provisions of the directive will be enforced more nearly to the letter. OPC's liberal attitude has been based on the realization that refiners were unprepared for the directive and that certain localities would have been shut off completely until physical adjustments could be made for delivering supplies by motor trucks in the 20-state area to which the order applies.

SENTENCE SUMMARIES

MID-CONTINENT: Prices for all products steady to firm. Interest increasing in all grades of fuel oil for northern, eastern shipment.

EAST COAST: Government reimbursement for abnormal product and transportation costs helps in overcoming supply barriers.

GULF COAST: No adverse reaction yet evident from Directive 57. Refiners place dependence on lend-lease business.

PACIFIC COAST: Fuel-oil demand continues rise. Refiners forced to draw liberally on stocks. Gasoline business diminishing.

PENNSYLVANIA: Eastern buyers absorbing all excess gasoline and fuel oils available. Prices steady.

A.P.I. REFINERY REPORT

Week Ended August 29, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks Gasoline	Residual	Gas oil
Appalachian	158	2,858	406	596
Ind., Ill., Ky.	737	14,547	3,625	5,595
Okla., Kans., Mo.	366	6,932	1,296	1,742
Censored group*	1,655	38,886	18,794	21,558
Rockies	94	1,949	535	434
California	687	15,659	53,298	12,135
Total Aug. 29, 1942	3,697	80,831	78,034	42,060
Total Aug. 22, 1942	3,723	80,443	78,007	40,416
Total Aug. 30, 1941	4,133	80,394	93,790	48,089

Note: Refinery runs and stocks for week ended September 5, 1942, appear on Trends page.

*Reports combined on East Coast, Gulf Coast, Louisiana-Arkansas and Inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines estimate)

Week ended:	Bbl. of crude*
August 29, 1942	249,007,000
August 22, 1942	246,307,000
August 30, 1941	249,413,000

*Excludes heavy, unrefinable stocks in California.

Gulf Coast

HOUSTON, Tex.—The anticipated reduction in tank-car shipments from the Gulf Coast refinery market as the result of the recent OPC Directive Order 57 which prohibits gasoline movement by rail to 20 states in Districts 2 and 3, failed to materialize and there was little change in the situation this week. A brisk demand continues for all refined products but movement was still limited due to lack of transportation facilities. There has been no large-scale readjustment in tank-car movement thus far and shipments to inland points continue on approximately the pre-directive rate. Most market observers anticipate an eventual reduction in movement as the result of Directive Order 57, but they are of the opinion that the contraction will be extended over a period of several weeks.

Most Gulf Coast refineries are depending upon lend-lease business and this is reported to have increased during the past few weeks. This is reflected by the fact that stocks have not shown any appreciable increase in spite of limited tank-car movement.

Quotations on refined products continue to be based on the ability to obtain tank cars. Sellers who can provide such facilities have no trouble in obtaining maximum prices.

Pacific Coast

LOS ANGELES, Calif.—Gasoline prices have been soft this week. Competitive-grade gasoline has slipped off fractionally in a dull market.

Fuel oil continues strong and withdrawals from storage are continuing. Future demand is expected to increase owing to expanding railroad transportation.

Diesel fuel and gas oil are at top prices and there is a ready market for all supplies. This demand reflects the use of distillates as blending agents for improving residual-fuel specifications.

A small group of West Coast dealers handling three brands of Pennsylvania Grade lubricating oil has been granted permission to increase lubricating-oil prices 5 cents per quart to equalize the ceiling of these marketers with those who raised prices last March.

There is very little movement of natural gasoline in the spot market.

REFINERY AND TANK-WAGON PRICES

(Prices as of September 8)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	....	....	....	5.875-6.000	.....	5.500-5.625	5.125-5.250
Pennsylvania	.....	.....	6.750-7.000	.....	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	.....	‖5.750-6.250	‖5.750-6.250	‖5.250-5.750	‖5.000-5.500
Northeast Coast	9.80	.....	.....	9.2	9.2	.....	.....
Pacific Coast	.....	6.750-7.000	6.500-6.750	6.375-6.500	6.000-6.375	5.500-5.750	5.000-5.125

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. ‖Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)‡
Oklahoma (Group 3)	3.625	4.350	.....
North Texas	3.250	3.900	.....
North Louisiana	3.375	4.050	.....
California	.....	.....	5.000-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.625-4.750	4.500-4.625	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250-6.625	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-5.500	4.250
Northeast Coast	.....	.....	.....	6.80	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	‡$1.35-1.45	$0.85-0.90
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85
Northeast Coast	.....	.....	.....	6.800	2.780	1.65
North Louisiana	.....	.....	.....	.....	.....	†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.625-3.750	3.500-3.625	$0.85	$0.85
Pennsylvania (West)	5.875-6.125	5.875-6.000	†5.250-5.500	.....
Northeast Coast	6.7	6.7	1.95	1.65
Pacific Coast	5.5	5.5	‡0.80-95	‡0.80
Gulf Coast	3.875-4.0	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300 ‖Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.250
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

Neutral Oil

CALIFORNIA		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		37.50
10 pour point		36.50
15 pour point		35.50
25 pour point		30.00
200 vis., at 70° F., 3 color		
Zero pour point		39.50
10 pour point		38.50
15 pour point		37.50
25 pour point		32.00
NEW YORK—		
Wax in bags fully refined:		
130-132 (A.m.p.) wax		5.850
133-135 (A.m.p.) wax		6.150
Crude scale:		
124-126 (A.m.p.) w.s.		4.250
124-126 (A.m.p.) y.s.		4.250

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30	.....	.....	†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R
Mid-Continent	16.8	.....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	15.45	5.50	10.20
Boston, Mass.	14.90	4.50	9.50
Burlington, Vt.	16.90	5.50	....
Buffalo, N. Y.	16.20	5.50	10.30
Dover, Del.	16.70	5.50	11.20
Hartford, Conn.	15.60	4.50	....
Manchester, N. H.	17.30	5.50	10.50
Newark, N. J.	14.70	4.50	9.40
New York, N. Y.	16.10	5.50	9.50
Philadelphia, Pa.	16.20	5.50	11.65
Pittsburgh, Pa.	16.70	5.50	12.00
Portland, Me.	16.30	5.50	9.60
Providence, R. I.	15.00	4.50	9.30
Washington, D. C.	14.70	3.50	10.70
Average 14 cities	15.91	5.07	10.32

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	13.40	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	14.40	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.15	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	21.40	7.50	11.40
Birmingham, Ala.	18.50	8.50	9.00
Charleston, S. C.	18.45	7.50	....
Charleston, W. Va.	18.75	7.50	13.00
Charlotte, N. C.	19.60	7.50	11.00
Jacksonville, Fla.	21.40	8.50	10.40
Jackson, Miss.	17.50	7.50	8.50
Louisville, Ky.	16.50	6.50	8.50
Memphis, Tenn.	18.60	8.50	10.50
New Orleans, La.	16.75	8.50	*10.00
Norfolk, Va.	16.95	6.50	13.50
Average 11 cities	18.58	7.59	10.58

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Albuquerque, N. M.	17.50	7.50	10.50
Boise, Idaho	20.10	6.50	16.80
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.57	5.96	10.76
Average last week	16.57	5.96	10.76

CRUDE-OIL PRICES

(Continued from Page 93)

Gulf Refining Co., 5-21-41, includes Rodessa, Texas.

COLUMN (4) EAST CENTRAL:
Humble Oil & Refining Co., 5-21-41, includes Anderson, Cherokee, Limestone, and Navarro counties and the Navarro Crossing field.

COLUMN (5) EAST CENTRAL:
Humble Oil & Refining Co., 5-21-41, includes Hawkins field.

COLUMN (6) NORTH TEXAS:
Stanolind Oil Purchasing Co., 12-11-41.

COLUMN (7) FISHER COUNTY:
Shell Oil Co., Inc., 12-11-41.

COLUMN (8) MEXIA:
Sinclair Prairie Oil Marketing Co., 5-30-41.

TEXAS FLAT-PRICE FIELDS

Agua Dulce (light), Benavides, Longhorn, Southland, and Sweden, 5-21-41 ..... $1.35
Agua Dulce (heavy), 10-16-41 ..... $1.25
Republic Oil Refining Co., 5-21-41.

Alfred and Magnolia City $1.35
Continental Oil Co., 5-21-41.

Alice, Benavides (North Sweden), Ben Bolt, Clark-Mull, Sun, and Tom Graham $1.35
Humble Oil & Refining Co., 5-21-41.

Batson (new), Humble (35° and above), Fig Ridge, Hardin, Hull (25° and above), La Belle, North Dayton (25° and above), Seabreeze South China, West Orange, Willow Slough and Oyster Bayou $1.25
Sun Oil Co., 5-21-41.

Cass County $1.20
Texas Co., 5-21-41.

Cayuga, Anderson County $0.90
Pan American Production Co., 5-21-41.

Chapel Hill, Smith County:
Crude distillate $1.30
Crude oil 1.18
Chapel Hill Gas System, 11-7-41.

Clay Creek, Washington County $1.00
Sun Oil Co., 5-21-41.

Cleveland, Liberty County $1.26
Magnolia Petroleum Co., 5-21-41.

Conroe, Montgomery County $1.43
Humble Oil & Refining Co., 5-21-41.
Tide Water Associated Oil Co., 5-21-41.
Sun Oil Co., 5-21-41.
Texas Co., 5-21-41.

Cotton Lake (South) $1.35
Sun Oil Co., 5-21-41:

East Texas and Flag Lake* $1.25
**Humble Oil & Refining Co.*, 5-21-41.
Pan American Production Co., 5-21-41.
Tide Water Associated Oil Co., 5-21-41.
Gulf Refining Co., 5-21-41.
Magnolia Petroleum Co., 5-21-41.
Sinclair Prairie Oil Marketing, 5-21-41.
Shell Oil Co., Inc., 5-20-41.
Sun Oil Co., 5-21-41.
Texas Co., 5-21-41.
Stanolind Oil Purchasing Co.

Esperson (35° and above), South Esperson $1.30
Sun Oil Co., 5-21-41.

Flour Bluff, East Flour Bluff $1.33
Humble Oil & Refining Co., 5-21-41.

Hockley and Cochran $0.87
Texas Co., 5-21-41.

Livingston and Mercy $1.25
Shell Oil Co., Inc., 5-20-41.

Long Lake $1.23
Sinclair Prairie Oil Marketing, 5-21-41.

Luby $1.35
American Mineral Spirits Co., 5-21-41.

Luling $1.05
Magnolia Petroleum Co., 5-21-41.

Lytton Springs $1.17
Magnolia Petroleum Co., 5-21-41.

Salt Flat, North Salt Flat, Darst Creek*, Hilbig, Clark, Carroll, and Zoborski $1.14
Humble Oil & Refining Co., 5-21-41.
Magnolia Petroleum Co., 5-21-41.
**Texas Co.*, 5-21-41.

Rincon (North), Sun, North Sun and Garcia $1.35
Sun Oil Co., 5-21-41.

Vturria $1.45
Sun Oil Co., 3-19-42.

Talco $0.79
Humble Oil & Refining Co., 5-21-41.
Magnolia Petroleum Co., 5-21-41.

Tomball and Satsuma $1.40
Humble Oil & Refining Co., 5-21-41.
**Magnolia Petroleum Co.*, 5-21-41.
Stanolind Oil Purchasing Co., 4-1-41.

Van, Van Zandt County $1.08
Humble Oil & Refining Co., 5-21-41.
Pure Oil Co., 5-21-41.

Yates (regular) $0.95
Humble Oil & Refining Co., 5-21-41.
Gulf Refining Co., 5-21-41.
Shell Oil Co., Inc., 5-20-41.

Yates (shallow) $0.82
Shell Oil Co., Inc., 5-20-41.

Overhauling of equipment is facilitated by special devices

Information supplied by "Oil and Gas Journal"

Much of the work of overhauling the heavy equipment such as compressors, engines and pumps used on pipe lines can be done more efficiently with the aid of special gadgets, some of which have been designed by station engineers.

At a crude oil main line station, engineers devised a handy jack to facilitate valve grinding. The operator's foot presses downward on a pedal to move the valve face upward against the emery wheel of the grinder, held directly above it.

Grinding of inlet valves is done more readily at some compressor stations by the use of a special frame, permitting turning the assembly so that it may be worked on conveniently in different positions. Much labor can be saved in the removal of certain types of exhaust valves by the use of a special jack-shaped device, suspended by a chain-hoist from an overhead crane. Chain-hoists have been useful in removing plungers from reciprocating pumps. The setting up of nuts is accelerated by electric motor driven equipment. A pneumatic drill has been adopted for the same purpose by installing a socket which fits over the nut.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

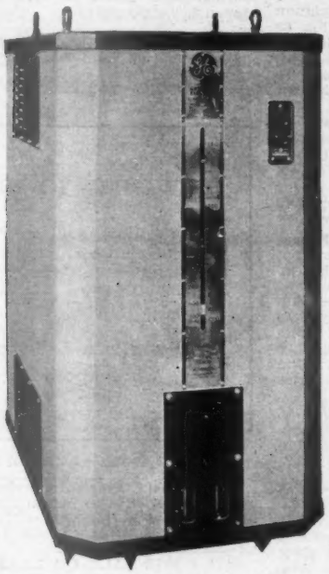
Climax Molybdenum Company
500 Fifth Avenue New York City

MOLY

EQUIPMENT PROGRESS...

New G-E Welding Transformers For Unionmelt Welding

A new line of heavy-duty alternating-current welding transformers especially designed for Unionmelt welding has been announced by General Electric Co.,



Schenectady, N. Y. The welders are available in 750 and 1,000-amp. sizes (NEMA) for 220, 440, and 550-volt power.

Features of the line are built-in capacitors and built-in primary control. The capacitors are valuable for improving voltage regulations of the power feeders, thus aiding uniform welding. The built-in primary control not only simplifies wiring, but is advantageous in portable installations because of its compactness. It includes a disconnecting switch and auxiliary transformer to furnish power for operation of Unionmelt auxiliaries.

Motor-operated, remote adjustment of the welding current permits an operator to make current adjustments without leaving the work. The equipment's integral reactance design permits full output to be obtained without the use of high or multiple open-circuit taps.

Fan cooling conserves vital materials and space. Ample ventilation and the arrangement of ducts permits two welders to be mounted side by side without the need for extra space between them for ventilating air.

The current output of each welding transformer is indicated by a large, accurately calibrated scale on the front of the case. Inorganic (Class B) insulation is used throughout.

Oil Protective Coating for Tanks

With metals on priority, RESISTAL M-600 presents a means for protection of new and repair of old equipment. To repair an old oil-tank bottom, a patented steel shell is installed concentric to the inside circumference of the tank. This steel shell extends from the pipe-line outlets down and is uniformly 2 in. equidistant from the inside circumference of the tank shell. This shell is anchored to the tank bottom, and the space between the shell and the tank is filled with RESISTAL plastic cement, which will retain plasticity and is insoluble in aliphatic hydrocarbons. A 1-in. thickness (minimum) of the RESISTAL cement is applied over a special priming coat upon the entire tank bottom. This installation and the tank bottom are given a final spray coat of RESISTAL M-600 to cover the metal band and eliminate corrosion on this installation. This installation provides an interior shell 2½ in. thick at the b.s. and w. line, and ½-in. thick over the entire bottom, to resist the corrosive action of the accumulated brines charged with H_2S and SO_2. Such applications eliminate all chime and lower ring corrosion and leaks, and also leaks and corrosion of the bottom. Large holes in the side sheets and bottoms are no obstacle to described RESISTAL applications. Such applications are warranted for a specific service period against leaks and replacement of sheets due to corrosion, the warranted service depending upon the severity of the specific corrosion problem.

RESISTAL M-600 is resistant to weak and strong acids and weak and strong alkalies. There is no embrittlement of the film due to age; water has no effect on the dried film; immersed in cold water or subject to 80 per cent relative humidity for 24 hours there is no water absorption; it is insoluble in all petroleum hydrocarbons. This protective film will not decompose unless subjected to dry heat in excess of 150° C. It is flexible and shows excellent adhesion to all clean metal surfaces. There is no loss of time due to drying; three coats may be applied in 3 hours and a tank may be placed in service after an overnight drying period. It is nonflammable.

Additional technical data on specific applications in refinery pipe-line and production departments may be obtained from Chemical Research Corp., P.O. Box 2001, Tulsa.

Van Nort Promoted by Duff-Norton

George A. Blackmore, chairman of the board of Duff-Norton Manufacturing Co., recently announced the appointment of J. F. Van Nort as general sales manager of the company. Mr. Van Nort formerly served as western division sales manager. He has established his headquarters at the general offices of the company, at Pittsburgh, Pa.

Before his affiliation with Duff-Norton, Mr. Van Nort was sales manager of the eastern division of Oil Well Supply Co., a subsidiary of United States Steel Corp. He joined the sales staff of Duff-Norton in December 1940, and eventually succeeded the late Alex Anderson as western division sales manager, with headquarters in Chicago, Ill.

New "Polar K" Oil

Curran Corp., Malden, Mass., has announced a light "Polar K" oil which is claimed to have properties of completely removing perspiration, water, oil, and dirt from steel surfaces.

The new oil is said to be superior to alcohol for dehydrating and cleaning steel surfaces, bearings, or similar parts which have become wet or have been left with a film of grinding emulsion.

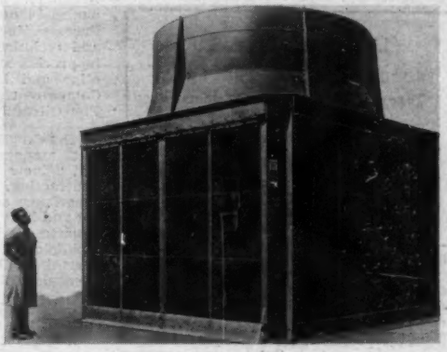
The new oil displaces and absorbs water and leaves a thin film of lubricant and rust preventive. The new oil is said to be especially applicable for protecting during storage the water side of steam turbines, water pumps, meters, and steel parts which may have been exposed to rain, immersion in sea water, or damp storage.

The fluid has also been found useful for spraying the inside of diesel and gasoline-engine cylinder walls which have accumulated a film of condensed moisture as a result of storage in damp atmosphere. Its use for flushing crankcases to remove sludge, moisture, and acid salts is being expanded.

The oil is completely soluble in hydrocarbon and lubricating oils and no subsequent cleaning procedure is necessary to remove the thin, film protective, rust-preventive lubricant.

Young Radiator Develops New Cooling Machine

Young Radiator Co., Racine, Wis., has developed a cooling machine far exceeding in physical size and capacity any standard Young product hitherto available for internal-combustion engines and compressor cooling or process plants. The new Young Quad atmospheric cooling unit resembles in its general appearance a tower extending into the air some 14 ft. and measuring about its base approximately 12 ft.



square. The name "Quad" indicates the arrangement of the cooling unit since it is formed into a four-sided assembly, the sides of which are comprised of heat transfer surfaces for water, oil or gas cooling and for steam or vapor condensing as required.

A high capacity induced draft fan—especially designed and built—is mounted horizontally at the top of the tower drawing air through the heat-transfer elements and discharging it upward through an aerodynamically designed discharge stack.

It is possible to cool a diesel engine of approximately 2,000-hp. capacity handling both the engine-jacket water and lubricating-oil cooling load at a horsepower expenditure of under 25 hp. The heat dissipating capacity of a single unit is equivalent to the total heat load which would be required to heat an apartment building having 60 to 70 six-room apartments.

One feature of design is the method of subassembly employed whereby the component side members are individually assembled and supported for ease of handling, the entire unit being erected at the point of operation with the various sides bolted into their respectve positions.

Columbia Chemical Executive Sales Office Moved to Pittsburgh

The executive sales office of the Columbia Chemical Division of Pittsburgh Plate Glass Co. has been moved to Pittsburgh from New York, Vice Pres. E. T. Asplundh has announced. Also involved in the transfer are the chemical division's traffic and advertising departments. "The move," Mr. Asplundh said, "is a continuation of the company's program of coordinating its various divisions in the general office at Pittsburgh. Several years ago the executive office of the paint division was moved to Pittsburgh from Milwaukee. W. I. Galliher, director of sales of the chemical division, will be in charge of sales activities from the new Pittsburgh headquarters."

W. I. GALLIHER

CLASSIFIED ADVERTISING

THE MARKET PLACE OF THE OIL INDUSTRY . . .

Patent Attorneys

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Form "Evidence of Conception" with instructions for use and "Schedule of Government and Attorney's Fees—FREE.

LANCASTER, ALLWINE & ROMMEL
Patent Law Offices
418 Bowen Bldg., Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

LEASES ROYALTIES

PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years' Experience
Inquiries Invited

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

FOR SALE: Oil and Gas leases on proven structures, drilling propositions, small production and fluorspar deposits. Reports furnished. W. P. Harley, Bowling Green, Ky.

I HAVE production on a large block of leases and I need capital to properly develop and market. Will make responsible party a very attractive proposition under certain circumstances. The Oil and Gas Journal, Box B-232, Tulsa, Okla.

STRIPPER property—Kansas—260 acres—cores 37' pay sand with recoverable oil over 6,000 bbls. per acre. Will lease for cash & over-ride. Will bear closest investigation. The Oil and Gas Journal, Box B-240, Tulsa, Okla.

FOR LEASE 160 Acres in Oil King Dist. Fresno Co. Near big development, registered dealers only. Wm. L. Crews, 200 Shaver St., San Rafael, Calif.

FLORIDA Oil Leases for sale—Jackson, Holmes, Washington counties. Spreads of 1000 acres; 25 cents per acre; 10-year leases; 10-cent rental. Paid up to 1943. Why wouldn't the Gulf Coast oil trends extend across Florida? Write for further information, 609 Gulf States Bldg., Dallas, Texas.

80,000 ACRES in Tennessee, timber, coal, oil and gas possibilities $2.00 per acre in fee. Write G. Lucas, 124 Milam Street, Shreveport, Louisiana.

FEW small tract considered on structure near 9,000 ft. East Texas Wildcat starting. Closing out 25 for one bets short time. E. Croft, Proctor, Texas.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

Business Opportunities

WANT a drilling proposition. Large Indiana acreage. Good structure. Jesse Allen, 1819 Garfield Ave., Terre Haute, Ind.

IT'S A FACT—

that year after year these columns carry more Classified Advertising than the combined totals of all other media devoted to the oil industry. RESULTS account for this remarkable record. Write for rates

Classified Department

The Oil and Gas Journal
Tulsa, Oklahoma.

Ranches and Farm Lands

14,000 ACRES ranch, Oklahoma. Is handling 700 cattle. In estate, must sell or will lease for oil or sell lease and royalty. Adjoins block of Major Oil Co. Write for description. Guy Speakman, Liberal, Kans.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Old Press. 215 East Third St., Tulsa, Okla.

Situations Wanted

CHEMIST, Refinery Engineer, licensed Chemical Engineer. Texas University Graduate. Thirteen Years experience includes Plant Engineer, Chief Chemist, and Process Engineer. Proven administrative and technical ability. Exceptional record in process studies and cost reduction gasoline and lube manufacture. Major Oil Company training. Draft 3-A. Box B-244, The Oil and Gas Journal, Tulsa, Okla.

EXECUTIVE ENGINEER: Desires contact management, requiring experience and "Know How", Heavy Engineering & Contracting. Age 38 with 20 years active experience sound organizations; oil refining and heavy chemical field; past 12 years departmental and project management, technology, estimating, engineering, and operating. Box B-263, The Oil and Gas Journal, Tulsa, Okla.

EXECUTIVE with thirty years experience in the oil business part of this time with major company and as vice-president of major independent company also as independent oil producer desires connection with independent company or with parties with money to invest in the oil business as there are many opportunities in the southwest to make money. Box B-262, The Oil and Gas Journal, Tulsa, Okla.

LAWYER, 48, twelve years practice, oil property trading experience since, desires position with reliable oil company. Box B-261, The Oil and Gas Journal, Tulsa, Oklahoma.

MAN with 15 years practical supervising experience in oil, gas, and cycling production. Will furnish details upon request. Box B-233, The Oil and Gas Journal, Tulsa, Okla.

ENGINEER: Experienced plant layouts, mechanical and structural design of high pressure processing and boiler plants and equipment; recently assisted in development and supervised design of large gasoline storage and distribution system using and reclaiming CO_2 blanket without compressors; age 46; salary $6,000. Box B-260, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

NOTICE TO ADVERTISERS

Advertisers offering positions to workers skilled in critical war industries are requested by the War Manpower Commission to include the following sentence in their advertisement:

"Applications from those now employed in war industries will not be considered."

ENGINEERS WANTED
Chemical or Mechanical with minimum one year oil refinery plant operation or maintenance experience. Require University Engineering School graduate with basic knowledge principles fluid flow. To work on process flow sheets, equipment selection and general handling oil refinery. Defense Contracts as assistant to senior engineers. No aliens or men engaged Defense work considered. Opportunity up to individual. In reply state experience, education, draft status, salary expected. Foster Wheeler Corporation, Room 2402, 165 Broadway, New York.

ROUSTABOUT WANTED, 40 to 55 years old, married, steady, reliable, clean, not in low draft classification, by reliable independent oil company with fifteen wells in Russell Couunty, Kansas. Must be willing to work hard at anything at any time needed. Good four-room house, gas, lights and water furnished, and salary of $110.00 per month. Must furnish own car. One mile from Standard grade school. Write P. O. Box 652, Russell, Kans.

EXCELLENT Drafting Position open to Draftsman experienced in Oil Field mapping. Draft exempt preferred. Laughlin-Simmons & Co., 615 Oklahoma Bldg., Tulsa, Okla.

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta Co., 115 S. Cinn., Tulsa, Oklahoma.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

OIL PRODUCERS urgently need these 2-U.S. and 1 Canad. Patents for the Extraction of Oil from exhausted formation of Petroleum and Oil bearing sands, for sale or in royalty by Leo Strandell, Lometa, Calif.

Equipment Wanted

WANTED
Large Steel Storage Tanks and Structural Steel Buildings.
GREENSPON'S
National Stock Yards
(St. Clair County), Ill.

ATTENTION INVENTORS
Old established Pacific Coast Manufacturing Company is interested in acquiring patented or patentable items for manufacture on either outright purchase or royalty basis. Box B-251, The Oil and Gas Journal, Tulsa, Okla.

WANTED—Steel tanks total 120,000 gallon capacity. Will take 5000 gallon or larger. Tidewater Equipment & Machinery Corp., 305 Madison Ave., New York, N. Y.

WANTED TO BUY

Pipe of all sizes, 2" to 16", inclusive, also refineries, pipe lines and abandoned wells. Wire, write or phone

Louisiana Iron & Supply Co.
Shreveport, La.

For Sale—Equipment

75,000 GALLON semi-spherical elevated steel tank, 80 feet to balcony, 4 foot riser pipe. Located at Hatch, New Mexico. B. F. Archer, Mayor, Hatch, New Mexico.

FOR SALE OR LEASE
1 Steam Powered Heavy Rotary Drilling Rig.
1 Steam Powered Light Rotary Drilling Rig.
1 Diesel Powered Rotary Drilling Rig, good for 5500 feet, using 4½" Drill Pipe.
LARGE LOT OF STEAM EQUIPMENT
2 Spudders with complete strings of Cable Tools, and Gas Engines.
Will sell above for cash or good notes, or will lease to responsible parties, preferably on continuous work.
Might exchange for interest in wildcat leases or production.
Also 3000 feet of used 3½" Drill Pipe, and 5000 Feet of used 4½" Drill Pipe; full hole tool joints; fair condition only for sale at bargain price for cash. Box B-243, The Oil and Gas Journal, Tulsa, Okla.

NEW OIL WELL DRILLING EQUIPMENT FOR SALE

Equipment purchased for shipment abroad sometime ago, now being offered either in part or in its entirety. Consists of large number Hughes Simplex Rock Bits, Reamers, Fish Tail Bits, Drilling Jars, Worthington Pumping Sets, Boring tubes, Drill Pipe Collars and miscellaneous replacement parts. Material located in New Jersey. Itemized lists furnished on request. Attractive prices.

MARINE METAL & SUPPLY CO.
167 South Street New York City

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

If we do not maintain a classification exactly suited to the type of advertisement you wish to run we shall be glad to create a fitting one.

Classified Department

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	*$1.05*	*$1.80*	*$2.55*	*$3.30*	*7 Lines*	*$2.45*	*$4.20*	*$5.95*	*$7.70*
4 Lines	*1.40*	*2.40*	*3.40*	*4.40*	*8 Lines*	*2.80*	*4.80*	*6.80*	*8.80*
5 Lines	*1.75*	*3.00*	*4.25*	*5.50*	*9 Lines*	*3.15*	*5.40*	*7.65*	*9.90*
6 Lines	*2.10*	*3.60*	*5.10*	*6.60*	*10 Lines*	*3.50*	*6.00*	*8.50*	*11.00*

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch	*1 time*	*$5.00*
1 Inch	*13 times*	*4.50 per inch*
1 Inch	*26 times*	*4.00 per inch*
1 Inch	*52 times*	*3.50 per inch*

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

VALVES & FITTINGS — RECONDITIONED—GUARANTEED

Write, wire or phone—New complete inventory of our stock of both steel and cast iron valves and fittings ready for immediate shipment. No priorities required.

Refinery Equipment—Pumps—Pressure Vessels—Tanks

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba
Riverside at Second, Kansas City, Kansas

Robert W. Duden
Twenty-First at Union, Tulsa, Oklahoma

LIQUIDATING LATE TYPE REFINERY

2000 bbl. Pipe Still, 2½" ID x 2 5/16" OD x 20' Tubes Alloy Headers — 2 Heat Exchangers — Complete Copper Sweetening Unit — New Carload Ethyl Plant — Storage Tanks — 30 Pumps, all sizes — Valves — Fittings — Pipe — 2 Gasoline Tank Trucks, 3 Compartments Each.

THE PLAINS OIL & REFINING CORPORATION
GREAT BEND, KANSAS

STORAGE TANKS

1—55,000 bbl. All Steel Riveted—6 Ring
1—55,000 bbl. All Steel Riveted—5 Ring
1—55,000 bbl. All Steel Welded
1—25,000 bbl. All Steel Welded
1—10,000 bbl. All Steel Welded

OFFERED FOR IMMEDIATE SALE, LOCATED EAST TEXAS. WIRE—PHONE—WRITE

SONKEN-GALAMBA SUPPLY CO.
Union Ave. at 21st St., Tulsa, Okla.
L.D. 410

FOR SALE: Complete Wilson Portable Rotary Rig with telescoping mast, suitable for 2,000 ft. drilling. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: Casing in two gas well, pipe and gathering lines, fittings and connections, 12½ and 8⅝ inch casing, 5½, 2, and 1 inch line pipe, gates and fittings, wells to be plugged and material sold. W. Ben Turner, Trustee, 103 No. 4th St., Sayre, Okla.

FOR SALE—PIPE
30,500' of 8⅝" O.D. Seamless Casing 32 lb. 8 V Thread.
22,000' of 8⅝" O.D.L.W. Casing 32 lb. 8 V Thread.
This pipe is located in Oklahoma and Kansas.
If interested please call or write:
HERMANN KAISER PIPE & SUPPLY
916 Palace Building Tulsa, Okla.
Phone 3-3413—Night 8633
or
MORAN PIPE & SUPPLY COMPANY
606 Tulsa Loan Building
Phone 3-3595—Night 3-7808

3" x 4" F&M Power Pump in excellent condition. Also Centrifugal & Steam Pumps. Gilbert Pipe & Supply, Electra, Tex.

FOR SALE: Approximately 250—2", 3", 4" and 6" LH EH SL UP Klein Pipe Tongs, used. $1.00 per inch per tong. Patridge, Cities Service Oil, Bartlesville.

20" x 12" ING. Rand Vacuum Pump. Also Compressors, Gas Engines, Bessemer parts. Gilbert Pipe & Supply, Electra, Tex.

FOR SALE: 50—5½" OD Standard IBBM NRS SE CI Gate Valves, unrepaired. $10.00 each. Patridge, Cities Service Oil, Bartlesville, Okla.

FOR SALE—One—40 K.W. Western Electric Generator powered with 60 h.p. Venn-Severin Oil Burning Engine with direct current Exciter. J. C. Ernest, Cosco Oil Co., Wynnewood, Okla.

FOR SALE: 3—16" Baash-Ross Blow-out Preventers. Patridge, Cities Service Oil, Bartlesville.

FOR SALE: 7¼ x 14 Oil Well Power Slush Pump. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: 2 Model R.L. Cardwell Double Drum drilling units. Complete with lines, steel dog houses, Koehler light plants, five and six inch tools. Ready to work. Box B-265, The Oil and Gas Journal, Tulsa, Oklahoma.

EQUIPMENT of crude oil refinery. As a whole or in part. A-1 condition. Marine Boiler, Still, Heat Exchangers, Flash Tower, Separators, Tanks, Duplex and Simplex Steam Pumps, Ten thousand feet pipe, Gate Valves and Fittings, Cooling tower, located in Illinois. If interested write for prices or appointment for inspection. Falls City Sales Co., Box 776 Louisville, Kentucky.

FOR SALE: No. 24 Steam Star Drilling Machine, in good condition. The Heatzer Engineering and Machine Company, Tiffin, Ohio.

FOR SALE: 60—4" 8V Thd. Fairbanks Sphero SE Valves, unrepaired. $10.00 each. Patridge, Cities Service Oil, Bartlesville.

FOR SALE: Star Mfg. Company, portable cooling tower, telescoping type, 7' wide, 13' long, 8' high. All steel. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: At Oklahoma City, one Sectional Steel sand or rock storage bin with two dump valves, $350.00. Patridge, Cities Service Oil, Bartlesville, Okla.

FOR SALE: 27½" Ideal Rotary Table, 5 sheave 200 ton Crown Block, 4 sheave 72" traveling block, 8" Ideal enclosed rotary hook. Melton Machinery & Supply Co., Seminole, Okla.

DIESEL—GAS—ENGINES
Large selection—All sizes and types. Generator units, marine engines, gasoline engines, auxiliaries—boilers, steam engines, and turbo-generator sets.
Complete information on request.
A. G. SCHOONMAKER COMPANY
48 Church Street, New York, N. Y.

FOR SALE: 12 K.W. Portable Light Plant Powered by 35 H.P. International Engine. Melton Supply Co., Seminole, Okla.

FOR SALE: 50—5½" OD 11½V Thd, 200—7" OD 10V Thd and 25—10" 8V Thd., used CI Flat Plugs, cheap. Patridge, Cities Service Oil, Bartlesville, Okla.

FOR SALE: Wilson-Mogul Drawworks with water cooled brakes and 100 H.P. International Motor. Melton Supply Co., Seminole, Okla.

FOR SALE: At Oklahoma City, 50 Solid and Split Casing Spiders with Slips for 9" and 9⅝" OD Casing. Complete, $50.00 each. Patridge, Cities Service Oil Co., Bartlesville, Okla.

EMCO-McGAUGHY Integrator for Foxboro and Emco Recording Orifice Meter Charts, good condition. Utility & Industrial Supply Co., Jackson, Mich.

FOR SALE at McCook, Nebraska: G. E. Centrifugal Air Blower, 12 H.P. G.E. Induction Motor, Worthington Boiler Feed Pump, Worthington Oil Pump, Worthington Gas Compressor, Steam-driven Gardner Gas Compressor, Steam-driven Cochran Boiler Feed Water Heater, 60 H.P. Wm. Bros. Boiler. Kansas-Nebraska Natural Gas Co., Inc., 1028 West Second St., Hastings, Nebraska.

FOR SALE: 42"x50' tower, 14-tray ¼" shell, with 14' skirt of ⅜", 48"x50' tower, 11 tray ¼" shell, with 17' skirt of ⅜", 48"x50' tower, 16 tray, ⅜" shell with 16' skirt of ⅜". 18 pieces 3⅞" x 16' cold rolled steel shafting, 15 cast iron companion flanges, sizes 8" to 16", 20 orifice flanges size 4" to 12". The following GATE VALVES. 4—5-3/16"; 50—6"; 6—8"; 8—10"; 1—12"; 1—16", Cushing Refining & Gasoline Company, Cushing, Oklahoma.

2—5"x12" DUPLEX, end packed line pumps 292 bbl. hr., 575 pounds pressure. 2—2½"x4 stage centrifugals complete with 150 h.p. motors and controls. Will sell pumps or motors separately. Corken Pump & Machinery Company, 206 East Grand, Oklahoma City, Oklahoma.

FOR SALE

EMULSIFIED ASPHALT UNITS

Complete, compact, new colloidal mills ready to operate on stationary or portable hookups. Units comprise electric or Ford Gas Motor, steam jacketed mill and pumps with panel thermometers and proportioning means. Adaptable to either asphalt emulsions or cutbacks. Capacity up to car load per hour. Specifications furnished. No priorities required. Priced reasonable. Box B-264, The Oil and Gas Journal, Tulsa, Okla.

LINE PUMPS
Two—2½" 4 stage Byron Jackson multiplex with 150 h.p. motors and controls
CORKEN PUMP & MACHINERY CO
206 East Grand Oklahoma City

FOR SALE
COMPRESSORS

Complete Repressuring or Air Lift Plant for Immediate Delivery.
2—13 & 5¼ x 12 Ingersoll-Rand XOB compressors 400# pressure V-belt driven by 120 H.P. Chicago Pneumatic 3-cylinder vertical gas engines.
2—12 & 7 x 10 Chicago Pneumatic 400# pressure vertical compressors direct connected to 120 H.P. 3-cylinder Chicago Pneumatic vertical gas engines complete.
Used very little—excellent condition. Located on original foundation in Louisiana.

EARL E. KNOX COMPANY
Erie, Penna.

FOR SALE: 30—1½ KW Steam Turbine Generators. $25.00 each. Patridge, Cities Service Oil, Bartlesville, Okla.

FOR SALE: 5 F. C. U. Waukesha Rebuilt Engines with Combination carburetors, clutches and housings. Warner Lewis Company, Tulsa, Okla.

COMPLETE DRILLING RIG

1—26 x 136 Parkersburg Drilling Derrick—637,500# & Substructure. 5500 feet 4½ Drill Pipe API full hole tool joints. 3 Boilers, 2 Blow-out Preventers, 2 Slush Pumps, Shale Shaker, all unitized. Numerous miscellaneous tools and accessaries. Now set up and running near Houston, Texas. Inventory and price on request

R. E. FLOYD
Conroe, Texas

FOR SALE: 85—7" OD 10V Thd. SE 1500-lb. WP CS Hughes Drilling Through Control Gates, unrepaired. $100.00 each. Patridge, Cities Service Oil, Bartlesville.

10—40/15 H. P. General Electric Type K Motors, 220/440 Volt 865 R.P.M. Weatherproof with complete control equipment—In original packages—No priority required. Southwest Equipment Co., 705 Ross Ave., Dallas, Texas.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio.

FOR SALE: 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

FOR SALE

We offer 523, 55-ton all-steel, self-clearing DOUBLE HOPPER CARS consisting of:

160 USRA construction; built 1921-1922; with A-B brakes; 1880 cubical feet capacity.
363 built 1910-1915; with KD-1012 brakes, 1683 feet capacity.

ALL HAVE FULL "U" CAST STEEL TRUCK FRAMES.
Purchaser must buy all.
PRICE: $1700.00 each f.o.t. Pennsylvania
TERMS: Cash with purchase.

DELIVERY CAN COMMENCE IMMEDIATELY AND BE COMPLETED IN ABOUT 60 DAYS—AND VERY POSSIBLY SOONER.

Some $30,000 to $40,000 NEW REPAIR MATERIALS also available which you may wish to have inspected at the same time.

TIME and EXPEDITION ESSENTIAL and DESIRABLE.
Yours for Victory,

IRON & STEEL PRODUCTS, Inc.
37 years' experience
13412 S. Brainard Ave., Chicago, Illinois
"ANYTHING containing IRON or STEEL"

Steel VALVES!

Cast and Forged
Also
Cast Iron Valves
Standard and High Pressure
Every Type Used in an Oil Refinery
All Expertly Reconditioned and GUARANTEED to Perform Like New.

No Delays

Immediate Delivery
YOU SAVE 25%
Over Cost of New Valves

Brown-Strauss Corporation
1446 Guinotte . . . Kansas City, Mo.

Journalisms:

BUTADIENE, the much-sought base material needed for the manufacture of synthetic tire rubber, can be produced from butane in a single step of dehydrogenation, according to experimental work conducted on a semicommercial scale at one of the country's leading research institutions. The steps in the process will be discussed in detail by V. I. Komarewsky and C. H. Reisz in an early issue and will be recognized by the subject, "Production of Butadiene by the Single-Stage Catalytic Dehydrogenation of Butane."

•

WHILE the nation anxiously awaits the report of the Baruch committee which will give a blueprint of things to come, so far as the average American and his automobile is concerned, consider these figures:

Half of the world's natural rubber was used in America before the Japs captured 97 per cent of the total supply.

Tires and tubes consumed 75 per cent of United States rubber.

The 54,000 communities (43 per cent) in the United States depend entirely on highway transportation; 872 cities depend entirely upon buses for mass transportation.

•

MOST oil men attend one or more technical meetings every year. By and large, the papers presented at these meetings are thoughtfully prepared, and worth while. But poor delivery often dulls the attention of the audience, and the author's paper suffers in direct proportion to the suffering of the audience. An author in a recent issue of a magazine published by a technical society, gives some valuable pointers on delivering a technical paper. These are:

1. Speak loudly enough to be heard throughout the room.
2. If a public address system is provided, speak directly into the "mike."
3. If slides are used, don't read the captions. Audiences can read.
4. While pointing to slide, face audience when speaking.
5. Make sure slides are well prepared and professional looking.
6. Avoid long, involved, hard-to-follow sentences.

CALENDAR

September

AMERICAN CHEMICAL SOCIETY, Petroleum Division, Statler Hotel, Buffalo, N. Y., September 10.

AMERICAN PETROLEUM INSTITUTE, Los Angeles Basin chapter, Division of Production, Shell Oil Co., Inc., Recreation Hall, Long Beach, Calif., September 15.

AMERICAN PETROLEUM INSTITUTE, Illinois Basin chapter, Emmerson Hotel, Mount Vernon, Ill., September 17.

NATIONAL PETROLEUM ASSOCIATION, annual meeting, William Penn Hotel, Pittsburgh, Pa., September 17-18.

October

INTERSTATE OIL COMPACT COMMISSION, autumn meeting, Palmer House, Chicago, Ill., October 1-3.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, regional meeting, St. Louis, Mo., October 2.

AMERICAN GAS ASSOCIATION, annual meeting, La Salle Hotel, Chicago, Ill., October 5-6.

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, twenty-third annual meeting, Dallas, Tex., October 8-10.

WESTERN PETROLEUM REFINERS ASSOCIATION, technical meeting, Wichita, Kans., October 9.

AMERICAN WELDING SOCIETY, annual meeting, Cleveland, Ohio, October 12-15.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division, Hotel Ambassador, Los Angeles, Calif., October 12-17.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, thirteenth annual convention, Wichita, Kans., October 19-21.

NATIONAL STRIPPER WELL ASSOCIATION, annual meeting, Wichita, Kans., October 19.

SOCIETY OF AUTOMOTIVE ENGINEERS, Mid-west Fuels and Lubricants regional meeting, Tulsa, October 22-23.

NATIONAL LUBRICATING GREASE INSTITUTE, tenth annual meeting, New Orleans, La., October 25-29.

NATIONAL ASSOCIATION OF CREDIT MEN, Petroleum Division, St. Louis, Mo., October 26-28.

NATIONAL SAFETY CONGRESS AND EXPOSITION, thirty-first annual meeting, Sherman Hotel-Palmer House, Chicago, Ill., October 27-29.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division, Austin, Tex., October 29-31.

WESTERN PETROLEUM REFINERS ASSOCIATION, technical meeting, Shreveport, La., October 30.

November

CALIFORNIA NATURAL GASOLINE ASSOCIATION, Los Angeles, Calif., November 6.

AMERICAN PETROLEUM INSTITUTE, twenty-third annual meeting, Palmer House, Chicago, Ill., November 9-13.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, thirty-fifth annual meeting, Netherlands Plaza Hotel, Cincinnati, Ohio, November 16-18.

AMERICAN CHEMICAL SOCIETY, national chemical exposition and national industrial chemical conference, Sherman Hotel, Chicago, Ill., November 17-21.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York, November 30-December 4.

December

NEW MEXICO OIL AND GAS ASSOCIATION, annual meeting, Artesia Hotel, Artesia, N. M., December 2.

PETROLEUM ACCOUNTANTS SOCIETY OF OKLAHOMA, Hotel Mayo, Tulsa, December 17.

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